IPO Pricing Regulation and Audit Fees: A Perspective from Institutional Changes in China

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Abstract

From the perspective of institutional change of IPO regulation, this paper discusses the relationship between IPO pricing regulation and audit fees in China. This paper finds that the audit fees of IPO companies are higher in the stage of pricing regulation in comparison to the stage of pricing marketization. We also find auditors charge higher audit fees for the private companies than state-owned companies during the IPO pricing regulation period. Furthermore in regions with tighten legislation, IPO audit fees are higher in the IPO pricing regulation period.

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1. Introduction

Since the stock market started trading in the 1990s in China, there has been a debate over whether the Chinese stock market should adopt a market-based mechanism or a government-regulated regime to guide the Initial Public Offering (IPO) pricing mechanism (Chen, Ke, Wu and Yang, 2018). The IPO pricing mechanism changed from a government regulated regime to market-based pricing and then switched back to the government regulated regime. In the IPO pricing regulation stage, the China Securities Regulatory Commission (henceforth, CSRC) controls the cap of price-earnings (P/E) ratio to limit the offering price. In the pricing marketization stage, the CSRC abolished the cap on the P/E ratio. Existing literature has discussed the economic consequences of the two IPO pricing mechanism in depth. On the one hand, in the IPO pricing regulation stage, IPO pricing efficiency is low, and the underpricing is high (Cheung, Ouyang and Tan, 2009). To enhance the offering price, IPO companies have a strong incentive to conduct earnings management, which will lead to the decline of the accounting information quality of IPO companies (Chen et al., 2018).On the other hand, the deregulation of IPO pricing has reduced the company's earnings management significantly, decreased IPO underpricing and improved the pricing efficiency of new shares (Liu and Wu, 2021). However, the deregulation of pricing has also caused problems such as high offering price, IPO excessive financing and high P/E ratios, which have harmed investors' interest (Li, Liu, Zhang and Zhang, 2021).

The auditors are important participants in the process of IPO, and their role is to ensure the authenticity of the accounting information of the IPO company (Copley, Douthett and Zhang, 2021; Xiong and Zhao, 2021). There will be litigation risks for the auditors and accountants if the company's performance is inconsistent after its IPO. According to the Judicial Interpretation [2003], No.2 issued by the Supreme Court of China on January 9, 2003, the service agency has joint liability for investors' losses if false statements are made (CSRC, 2003). Simunic (1980) put forward that in addition to the cost such as manual labour, material resource and time invested by the auditor in the audit process, and the profits of auditors, the audit fees should also include the costs related to litigation risks. Therefore, audit fees consist of audit costs and costs associated with audit risks (henceforth, risk costs) which may be involved with the loss of lawsuits and the cost is used to restore reputation (Pratt and Stice, 1994; Chy, De Franco and Su, 2021). And these form our research questions, which are, under different IPO pricing mechanisms, how to determine the audit fees to compensate for possible legal risks and the reputation loss of the auditors? How will the property rights and the legalization in different regions affect the audit fees under different IPO pricing mechanisms?

This paper examines the changes in the IPO pricing mechanisms from the government-regulated regime to the market-based mechanism and studies the impact of these two IPO pricing mechanisms in the various stages of changes of the government regulation on the audit fees. The investigated companies are divided into state-owned and private companies. This paper conducts an empirical test using 1,134 non-financial IPO companies from June 19, 2006 to May 14, 2014 and finds that, firstly, ceteris paribus, compared with the IPO pricing marketization period, the audit fees of the IPO companies are higher during the period of IPO pricing regulation. Secondly, comparing to the pricing marketization period, the IPO audit fees for private companies are higher than that of state-owned companies in the price regulation phase. During the IPO pricing regulation period, the IPO company that is located in the tightened regulation region, has stricter enforcement in law and more likely to incur higher audit fees. By studying further on the economic consequences of the regulation phase, this paper finds that companies listed in the IPO pricing regulation phase are more likely to have inconsistency in their financial performance, the probability and have higher frequency of administrative penalties for violations. This shows that the IPO companies in the IPO pricing regulation period are more risky resulting in the higher audit fees charged by auditor firms.

The contributions of this paper are as follows. First, from the perspective of institutional changes, it enriches the literature on the impact of government regulation on intermediary institutions. Existing literature on the IPO pricing regulation mainly focuses on the impact of pricing regulation on the company's issue price (Tian, 2011) and the impact on investors (Gao, 2010; Gao, Lu and Ni, 2019). There are a few literature documents on intermediary institutions' impact. This paper studies the impact of government regulation on the IPO audit fees of audit firms. And this paper takes the historical changes in the IPO pricing as a background, and it is more conducive to reflecting the impact of government-regulated IPO pricing mechanisms on audit fees.

Second, the paper expands the literature on the factors that are significant to audit fees. The literature on audit fees mainly studies the factors that affect audit fees from the perspective of companies and services provided by auditors (Simunic, 1980; DeFond and Zhang, 2014). From the perspective of government regulation, this paper links the IPO pricing mechanism with audit fees. The paper studies the impact that the IPO pricing regulation on the audit fees "regulation-deregulation-regulation" phases, supplementing potential factors affecting audit fees and expanding the literature about audit fees.

Finally, it provides a reference for government regulators to make decisions on the IPO pricing management. This paper helps regulators improve the effectiveness of IPO pricing mechanism by comparing the impact of pricing regulation and the pricing marketization on audit fees and evaluating the impact of different pricing methods on the capital market and intermediary agencies.

The rest of the paper is arranged as follows: section 2 introduces the institutional background of the IPO pricing mechanism and the literature review. Section 3 is the hypothesis development. Section 4 presents the research design. Section 5 presents the main empirical tests and several robustness tests. Section 6 conducts further analysis. Section 7 is the conclusion.

2. Institutional background and literature review

2.1Institutional change in IPO pricing

In the development process of IPO pricing, the IPO pricing mechanism in China has been under the control of government regulation. The CSRC has also initiated many market-oriented reforms concerning the IPOs, as provided in Table 1 indicating the chronological stages in the IPO pricing reform. Several reforms in the IPO pricing system were conducted before 2014. Drawing on the experience of mature markets abroad, in the mid-year of 2004, the CSRC decided to conduct another IPO pricing reform and launched the book-building on December 7 in 2004. The book-building is a new pricing mechanism that determines the offering price by consulting the institutional investors. There was no upper limit on the IPO price set up by the CSRC, however, only a few companies in the A-share market have P/E ratio of more than 30 times at their IPOs (Wang, Su, Coakley and Shen, 2018). On April 29, 2005, the share-splitting reform was officially launched, and the IPO was suspended from May 2005 to June 2006. The CSRC promulgated the "Administrative Measures on Securities Issuance and Underwriting" on June 19, 2006, which uniformly regulated securities issuance and underwriting in China. To improve the efficiency of the issuance of new shares and protect the interests of minor shareholders, the CSRC cancelled the limit of 30 times on P/E ratio on June 10, 2009, and released the guidance of the P/E ratio in the process of issuing new shares, and officially launched market-oriented reform of the book-building. However, in the next few years, the phenomenon of "below offering price" and "three high phenomena" (high offering price, high P/E ratio, and highly excessive financing) often appeared on the primary market. Therefore, on April 8, 2012, the CSRC implemented the book-building reform again, stipulating that the IPO

offering price must be made based on the P/E ratio in the same industry, indicating that the government has re-initiated price regulation on the IPO issue price. After the implementation of the "GEM Initial Offering" on May 14, 2014, the P/E ratio of new shares has so far been controlled within 23 times, which means that the pricing of new shares has completely returned to the regulatory era (Kooli and Zhou, 2020).

Table 1 Institutional changes in IPO pricing

Time period	Pricing Method	Pricing cap	Regulation
1992.01-1999.09	Fixed price and fixed P/E ratio	15 times P/E ratio	Yes
1999.09-2001.08	Cumulative insurance pricing	No	No
2001.11-2004.12	Fixed P/E ratio	20 times P/E ratio	Yes
2005.01-2009.06	Book building	30 times P/E ratio	Yes
2009.06-2012.04	Book building	No	No
2012.05-2014.05	Book building	Refer to the same industry	Yes
2014.05-now	Book building	23 times P/E ratio	Yes

Note: Refer to Song and Tang (2017) and the reform of the IPO system

2.2Literature review

2.2.1. Government regulation and IPO pricing

There are extensive research has done on government pricing regulation and its impacts on the pricing efficiency of IPOs. Cheung et al. (2009) point out that although China's IPO market has undergone the “regulation-deregulation-regulation” cycles, the regulatory environment of the entire market is constantly improving. Compared with the government regulatory phase, the IPO pricing efficiency is higher in the market pricing stage when a stronger corporate governance structure is chosen, this is further proved for state-owned enterprises (Fan, Wong and Zhang, 2007, He, Ma, Wang and Xiao, 2019). The IPO pricing regulation also affects earnings management. The upward earnings management phenomenon generally exists in the IPO pricing regulation stage, and the degree of earnings management in the pricing marketization period is lower (Kao, Wu and Yang, 2009). Chen et al. (2018) find that compared with the IPO pricing marketization period, companies have a higher degree of upward earnings management and lower quality of financial statements in the pricing regulation period.

2.2.2Audit fees

Audit fees include audit costs, normal compensation and risk compensation for the potential risks in the audit process (Kannan, Skantz and Higgs, 2014; DeFond and Zhang, 2014; Zhang and Shailer, 2021). Since Simunic (1980) pioneered the pricing model of audit fees, researchers have examined the influencing factors of audit fees, such as institutional environment, client characteristics and auditor characteristics. The institutional environment is a significant feature of China’s audit market. Chen, Sun and Wu (2010) argue that the audit failures related to the client economic importance are mixed due to the institutional improvement. Audit failures decrease significantly when the investor protection improves in China after 2000, and the associated audit fees may increase subject to the improved audit quality, client earnings quality and reduced litigation risk when the audit market is more concentrated (Huang, Chang and Chiou, 2016). This is further indicated by Gunn, Kawada and Michas (2019) that when client firm size is used as a proxy for audit market concentration, the audit fees are also increasing. Given the importance of the auditor’s characteristics to the audit fee, the audit fee decreases

when the auditor has industry expertise and long-term association with the client that increases the familiarity with the client's operations (DeFond and Zhang, 2014; Yen, Lim, Wang and Hasu, 2018).

2.2.3 Summary

Existing literature on the economic consequences of IPO pricing regulation mainly focuses on the impact on companies, but less on the pricing regulation on intermediaries. As an important intermediary in the capital market, audit firms are independent third-party and have the ability and motivation to identify whether the financial information of the IPO company is fair, which will be passed to investors to reduce information asymmetry between IPO companies and investors (Cheung et al., 2009). Auditor has a significant role in assessing the company's information ensuring the financial information is genuine, and the audit fee is an indispensable medium between the auditor and the IPO companies. Therefore, it is of great significance to study the impact of IPO pricing regulation on audit fees with the impact of institutional change. The constant change of IPO pricing policies in China's capital market, "regulation-deregulation-regulation", provides an excellent setting for studying the impact of pricing regulation on the behaviour of intermediaries. This paper can enrich the literature on the factors affecting audit fees and provide suggestions for the subsequent reform of the IPO pricing mechanism.

3. Hypothesis development

3.1IPO pricing regulation and audit fees

China has introduced the book-building in 2004 to request the underwriters to determine the IPO pricing interval by inquiring from fund companies and other institutional investors, however, because of the government control over the upper limit on the P/E ratio during the IPO pricing regulation period, the book-building was not effectively applied and was "in name only" (Cheung et al., 2009). Because of the weak legal environment in China that the supervisory authorities are difficult to detect the corporate earnings manipulation, and the investors are relatively inexperienced, the IPO company may be more advantageous to obtain more capital through raising the IPO price and managing higher EPS (Chen et al., 2018; Doidge, Karolyi and Stulez, 2007). In the pricing marketization stage, the P/E ratio is no longer restricted by the government regulation, and the underwriters can assist the IPO company to determine the offering price by consulting the institutional investors. Institutional investors will then fully investigate the company's actual profitability that is used to determine the IPO pricing (Cheung et al., 2009). Any suspicious earnings manipulation will give a negative signal to the investors and then affect investors' judgement on the company's future value, management integrity and corporate governance, and will further affect the company's pricing. To avoid the negative effects of earnings management on the company, management has an incentive to hire high-quality or well-reputed auditors to signal the company's good performance and governance to the market to obtain a better IPO quote. Therefore, compared with the pricing marketization period, IPO companies in the pricing regulation period will have stronger earnings management motivation (Chen et al., 2018).

As an independent third party, the auditors rely on their professional judgement and independence to audit the financial statements of the IPO company and make a reasonable assessment as to whether the company's accounting information is fair and reliable to reduce the information asymmetry. In the IPO pricing regulation period, to raise the offering price and obtain more financing, the IPO company's earnings management motivation is stronger, which will decrease the reliability of the accounting information. To ensure the reliability of accounting information collected from clients, auditors are expected to expand the audit scope, increase the audit time, and implement more audit procedures leading to a significant increase

in audit costs. Furthermore, according to the auditing insurance theory, the audit is a risk-transferring mechanism that the IPO companies may transfer the risks to audit firms (Brown, Shu, Soo and Trompeter, 2013). In the pricing regulation period, IPO companies have a strong motivation for earnings management, the risks associated with earnings manipulations and material misstatements are expected to transfer to auditors and result in higher risk premiums (Chan, Mo and Zhang, 2021). Simultaneously, IPO companies are willing to pay more to mitigate their risks and generate more funding from investors. Therefore, compared with the pricing marketization period, auditors have higher audit costs and risk premiums during the IPO pricing regulation period, which means that auditors will charge higher audit fees to cover audit costs and litigation risks. Therefore, we propose Hypothesis 1.

H1: Compared with the pricing marketization stage, auditors charge higher audit fees for IPO companies during the pricing regulation stage.

3.2 The property rights and audit fees

This paper will further examine the impact of ownership structure on audit fees based on the changing institutional background of IPO offering price (Leventis, Weetman and Caramanis, 2011). Throughout the shift of the institutional backgrounds of the IPO pricing, the state-owned companies are found to have less intention to pay premiums for audit fees than the private companies because of their strong bargaining power in auditor selection and large scale and influence in the relevant industry, although the audit fees are found to have a positive relationship with the high-quality audit services (Simunic and Wu, 2009; Wang, Wong and Xia, 2008). During the IPO regulation period, state-owned companies are more likely to raise the IPO pricing when earnings management is found (Liu et al., 2014). Since the state-owned company have the government's guarantee and are with lower operating risks, they can often rely on the government to protect them from fierce competition and have fewer exit risks (Chen, Shi and Xu, 2013). In summary, in the pricing regulation period, due to the strong bargaining power and low operational risks of state-owned companies, they are expected to be less willing to pay premiums for high-quality audits. Therefore, compared with private companies, the audit fees of state-owned companies are lower. Therefore, we propose Hypothesis 2.

H2: Compared to the IPO pricing marketization stage, the audit fees of state-owned companies in the IPO pricing regulation stage are lower than those of non-state-owned companies.

3.3Legalization level and audit fees

There is a large difference in the legal environment in different regions of China. A well-constructed legal environment can increase costs to the auditor if fraud is identified, which is specifically reflected in three aspects: (1) the better the regional legal environment, the higher the probability that auditors' fraud will be found, and penalties can be enforced more effectively (Firth, Mo and Wong, 2012). (2) the regions with a better legal environment tend to have higher levels of marketization and more transparent information, which means that audit fraud is more likely to be exposed by the media, exacerbating the auditor's reputation risk (He et al., 2016). (3) investors in regions with higher levels of legalization, investors often have better the legal knowledge and higher awareness of rights protection (Lennox, Wu and Zhang, 2016). In areas with a relatively sound legal environment, auditors are subject to the constraints of regulators, the media, and investors. The higher the cost of audit fraud, the greater the risk of litigation. Therefore, compared to the pricing marketization stage, when the IPO company has strong earnings management during the pricing regulation stage, due to the potential litigation and reputational risks, auditors will expand the scope of audits, increase audit procedures, and require higher risk premium compensation, which makes audit fees higher (Chen et al. 2018). Therefore, we propose Hypothesis 3.

H3: Compared with the IPO pricing marketization stage, the regions with higher levels of legalization in the pricing regulation stage have higher audit fees.

4.Research design

4.1Sample selection and data sources

The share-splitting reform was launched in April 2005, and the stock market was suspended from the end of 2005 to mid-2006. The CSRC promulgated the "Administrative Measures on Securities Issuance and Underwriting" on June 19, 2006, which uniformly regulated the securities issuance and underwriting in China. After the implementation of the "GEM Initial Offering" on May 14, 2014, new regulation measures were implemented for the offering price of new shares. Therefore, this paper takes June 19, 2006 as the starting point of the sample and May 4, 2014 as the ending point. This sample used in this paper is based on the IPO companies listed on the Shanghai and Shenzhen Stock Exchange during this period. The sample is selected according to the following procedure: (1)exclude financial companies; (2) exclude samples with missing data; and (3) obtain 1134 observations. To eliminate the impact of extreme values, 1% winsorize processing is performed on all continuous variables. The financial data of this paper comes from the China Stock Market & Accounting Research (CSMAR) database, and the data of the IPO companies come from the WIND database.***Table 2 Sample distribution***

Panel A Year distribution

Year	N	Percent
2006	63	5.56
2007	107	9.44
2008	75	6.61
2009	97	8.55
2010	330	29.10
2011	267	23.54
2012	148	13.05
2014	47	4.14
Total	1,134	100

Panel B Industrial Distribution

Industry Code	N	Percent
A	17	1.50
B	22	1.94
C	793	69.93
D	13	1.15
E	36	3.17
F	29	2.56
G	26	2.29
H	3	0.26
I	124	10.93
K	12	1.06
L	17	1.50
M	9	0.79
N	13	1.15
Q	4	0.35
R	16	1.41
Total	1,134	100

4.2Model and Variable Definition

The main variables are the IPO pricing regulation and audit fees.

4.2.1IPO pricing regulation

The pricing regulation stage and the pricing marketization stage are identified in this paper to illustrate the shift of the institutional background to the IPO pricing. This paper sets the variables *Reg1* and *Reg3* to represent the pricing regulation stage. *Reg1* represents the first stage of pricing regulation. If the IPO date is from June 19, 2006 to June 10, 2009, *Reg1* is set to 1, otherwise is0; *Reg3* represents the second stage of pricing regulation. The date is from April 9, 2012 to May 14, 2014, *Reg3* = 1, otherwise is 0. *Reg2* stands for the pricing marketization stage. If the initial public offering (IPO) date is from June 11, 2009 to April 8, 2012, Reg2 is set to 1, otherwise is 0.

4.2.2Audit fee rate

This paper sets the variable *Fee_rate* to represent the IPO audit fee rate, and is calculated as (audit fees of IPO / IPO proceeds).

4.3Model settings

To test Hypothesis 1, this paper refers to the model of Simunic (1980) and adds a variable representing whether the IPO listing time is in the pricing regulation stage. The following model (I) is established to examine the impact of pricing regulation on IPO audit fees.

$$Fee\_rate = \beta_0 + \beta_1 * Reg1 + \beta_2 * Reg3 + Control\ Variables + \sum Industry + \varepsilon \quad \text{(I)}$$

Among them, the dependent variable Fee_rate represents the percentage of IPO audit fees. To prevent collinearity problems, the model does not include Reg2. Only the variables Reg1 and Reg3 are added to the model to indicate whether the IPO is issued during the pricing regulation stage. We refer to Simunic (1980) and select the control variables from the perspective of the financial status, operating risk, and financial intermediary characteristics of the IPO company as follows: the asset-liability ratio (*Lev*), current ratio (*Current*), and total return on assets (*ROA*), operating cash flow (*OCF*), company size (*Size*), business complexity (*Complexity*), audit firm size (*Big4*), underwriter reputation (*Underwriter*), industry effect (*ΣIndustry*).

To test Hypothesis 2 and Hypothesis 3, based on model (I), we added the following variables (Factor) and the variable Factor is comprised of the corporate property rights (*SOE*), the level of regional legality (*LAW*), and construct cross item with Reg1 and Reg3 respectively. To build the following model (II).

$$Fee\_rate = \beta_0 + \beta_1 * Reg1 * Factor + \beta_2 * Reg3 * Factor + \beta_3 * Reg1 + \beta_4 * Reg1 + \beta_5 * Factor + Control\ Variables \quad \text{(II)}$$

Among them, *SOE* indicates whether the IPO company is a state-owned enterprise; the degree of legalization (*LAW*) in the region is represented by the legal environment index. The variables in this paper are defined as follows in Table 3:

Table 3 Variable definitions

VARIABLES	VARIABLE DEFINATION
Fee_rate	Audit fees of IPO / IPO proceeds
Reg1	Reg1 takes 1 when the date of initial public offering is 2006.6.19 -2009.6.10, otherwise is 0.
Reg3	Reg3 takes 1 when the date of initial public offering is 2012.4.8 - 2014.5.14, otherwise is 0.
Lev	Total liabilities divided by total assets at the end of the year before IPO
Current	Current assets divided by current liabilities at the end of the year before IPO
ROA	Net profit divided by total assets at the end of the year before IPO
OCF	Net cash flow from operating activities divided by total assets period at the end of year before IPO
Size	Log of the company's total assets in the end of the year before IPO
Complexity	The sum of the net inventory and net receivables divided by the total assets at the end of the year before IPO
Big4	Dummy variable, the audit firm is international "Big Four", Big4 is 1, otherwise is 0
Underwriter	Dummy variable, the underwriter's income is in the top ten, underwriter takes 1, otherwise is 0
SOE	Dummy variable, 1 if the IPO company is a state-owned company, otherwise is 0.
LAW	Legal environmental index in different province
Industry	Industry variables

5. Empirical Analysis

5.1Descriptive statistics and correlation analysis

5.1.1Descriptive statistics

Table 4 reports the descriptive statistics of the main variables. The results show that the average percentage of the IPO audit expense ratio is 0.004, the median is 0.003, and the difference between the maximum and minimum values is large, indicating that the audit fees ratio varies greatly among different companies. From the descriptive statistics of Reg1, Reg2, and Reg3, it can be found that 65% of companies listed in the pricing deregulation stage (Reg2), and the companies listed in the pricing regulation stage (Reg1 and Reg3) account for 21.6% and 13.2% respectively. The descriptiveness of other variables is similar to the existing research.

Table 4 Descriptive statistics of the total sample

VARIABLES	N	MEAN	SD	MIN	MEDIAN	MAX
Fee_Rate	1134	0.004	0.003	0.000	0.003	0.017
Reg1	1134	0.216	0.412	0.000	0.000	1.000
Reg2	1134	0.652	0.477	0.000	1.000	1.000
Reg3	1134	0.132	0.339	0.000	0.000	1.000
Lev	1134	0.478	0.163	0.104	0.483	0.849
Current	1134	1.868	1.290	0.420	1.519	8.541
ROA	1134	0.140	0.072	0.027	0.127	0.395
OCF	1134	0.129	0.096	-0.093	0.121	0.407
Size	1134	20.213	1.129	18.498	19.977	24.693
Complexity	1134	0.346	0.159	0.013	0.347	0.743
Big4	1134	0.041	0.199	0.000	0.000	1.000
Underwriter	1134	0.471	0.499	0.000	0.000	1.000

Table 5 describes the statistical results of the audit fee rates in different stages. In Reg1, Reg2, and Reg3, the mean values of the dependent variables Fee_rate are 0.005, 0.004, and 0.007 respectively, and the median values are 0.004, 0.003, and 0.006 respectively. Moreover, according to the results of the mean test and the median test of the two groups (Reg1 vs Reg2, Reg2 vs Reg3), it is shown that the mean and median values of Reg1 vs Reg2 and Reg2 vs Reg3 groups are significantly different. In addition, it can be seen from the statistics of the audit fees rate by stages in Figure 1 that there are large differences in the audit fee rates at different stages.

Table 5 Descriptive statistics and group test results by stages

Reg	Fee_rate	
	Mean	Median
1	0.005	0.004
2	0.004	0.003
3	0.007	0.006
	T-test	Rank sum-test
Reg1 vs Reg2	0.000***	0.000***
Reg2 vs Reg3	0.000***	0.000***

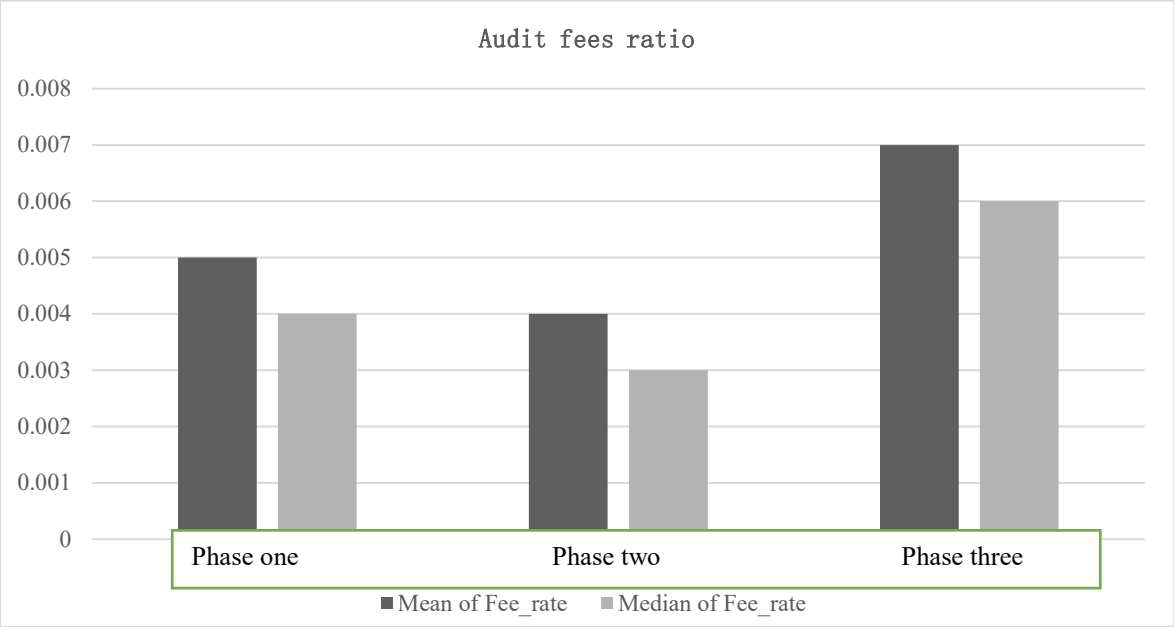

Figure 1 Audit fee ratio statistics in three stage

5.1.2 Correlation analysis

Table 6 reports the correlation among the main variables. Among them, the audit fees rate is significantly positively correlated with Reg1 and Reg3, and significantly negatively correlated with Reg2, which initially supports Hypothesis 1. The absolute values of the correlation coefficients among the other variables are less than 0.6, indicating that there is no serious collinearity among the control variables.

Table 6 Correlation analysis

	Fee_rate	*Reg1*	*Reg2*	*Reg3*	*Lev*	*Current*	*ROA*	*OCF*	*Size*	*Complexity*	*Big4*	*Underwriter*
Fee_rate	1											
Reg1	0.098***	1										
Reg2	-0.321***	-0.718***	1									
Reg3	0.331***	-0.205***	-0.534***	1								
Lev	-0.058*	0.258***	-0.121***	-0.143***	1							
Current	0.071*	-0.208***	0.080**	0.140***	-0.715***	1						
ROA	-0.129***	-0.229***	0.172***	0.035	-0.694***	0.561***	1					
OCF	-0.147***	-0.057	0.098**	-0.069*	-0.390***	0.257***	0.588***	1				
Size	-0.227***	0.081**	-0.110***	0.056	0.520***	-0.380***	-0.459***	-0.236***	1			
Complexity	0.055	-0.056	0.045	0.006	0.150***	0.017	-0.058*	-0.423***	-0.133***	1		
Big4	-0.052	0.127***	-0.127***	0.023	0.110***	-0.113***	-0.146***	-0.046	0.463***	-0.113***	1	
Underwriter	-0.130***	-0.105***	0.052	0.054	-0.064*	0.079**	0.048	-0.005	0.143***	-0.018	0.096**	1

5.2 Main analysis

5.2.1 Impact of pricing regulation on audit fees

Table 7 reports the result of the regression about the impact of IPO pricing regulation on audit fees. In column (1), only two variables are added, Reg1 and Reg3, the coefficient of reg1 is 0.002, coefficient of reg3 is 0.003. Both of the coefficients of reg1 and reg3 are statistically significantly positively related to the rate of audit fees, preliminary supporting H1. Column (2) shows the results for the regression after adding the control variables. After controlling other factors, the coefficient of reg1 is 0.001, which indicates that the audit fees rate in the first stage of the pricing regulation (reg1) is 0.001 higher than that of pricing marketization stage, and the coefficient of reg3 is 0.004, which indicates that the audit fees rate in the second stage of pricing regulation (reg3) is 0.004 higher than that of pricing marketization stage. Both coefficients of *Reg1* and *Reg3* are still significantly positive at a level of 1%. The result indicates that compared with the pricing marketization stage, firms in the pricing regulation stage charge higher audit fees from IPO companies, further verifying H1.

In terms of control variables, the financial characteristic variables *ROA*, *OCF*, and *Size* are significantly negative, which indicates that the better the financial status of the enterprise, the lower the audit risk, and the lower the fees charged by the auditor. The financial intermediary variable *BIG4* is positively related to audit fees, which indicates that the international *BIG4* audit firms will charge relatively higher audit fees due to their reputation effects. The underwriter's reputation *Underwriter* is significantly negative related to audit fees. This may be because of the IPO companies hire more reputable underwriters signalling the company's good operation to the auditor, reducing the auditor's risk, and leading to lower audit fees.

Table 7 Impact of pricing regulation on audit fees

	(1)	(2)
VARIABLES	Fee_rate	Fee_rate
Reg1	0.002***	0.001***
	(7.046)	(5.710)
Reg3	0.003***	0.004***
	(9.532)	(10.329)
LEV		-0.001
		(-0.494)
Current		0.000
		(1.297)
ROA		-0.013***
		(-7.531)
OCF		-0.003**
		(-2.392)
Size		-0.001***
		(-7.586)
Complexity		-0.001
		(-1.160)
Big4		0.001**
		(2.392)
Underwriter		-0.001***
		(-3.362)
Constant	0.002***	0.026***
	(4.957)	(9.892)
Industry FE	YES	YES
Observations	1,134	1,134
R-squared	0.175	0.302

Note: *, **, and *** indicate significant levels at 10%, 5%, and 1%, respectively

5.2.2 Property rights of enterprises and audit fees

This paper adds cross-terms to test the impact of the property rights of enterprises on audit fees under different IPO pricing mechanisms. As can be seen from Table 8, the coefficients of cross terms *Reg1 * SOE* and *Reg3 * SOE* are -0.001 and -0.003 respectively, and significant negative at the levels of 10% and 1%. This shows that the negative correlation between pricing regulation and audit fees is more significantly reflected in the group of state-owned enterprises, which supports H2.

Table 8 Regression results of property rights of enterprises and audit fees

	(1)
VARIABLES	Fee_rate
Reg1	0.001***
	(5.401)
Reg3	0.004***
	(10.570)
SOE	0.000
	(1.280)
*Reg1*SOE*	-0.001*
	(-1.697)
*Reg3*SOE*	-0.003***
	(-3.068)
LEV	-0.001
	(-0.516)
Current	0.000
	(1.275)
ROA	-0.013***
	(-7.603)
OCF	-0.003**
	(-2.476)
Size	-0.001***
	(-7.766)
Complexity	-0.001
	(-1.353)
Big4	0.001***
	(2.617)
Uuderwriter	-0.001***
	0.026***
Constant	(10.042)
	-0.001***
Industry FE	YES
Observations	1134
R-squared	0.310

Note: *, **, and *** indicate significant levels at 10%, 5%, and 1%, respectively

5.2.3 Legalization level and audit fees

The regression results of legalization level and audit fees are shown in Table 9. The coefficients of the cross terms (*Reg1 * LAW*, *Reg3 * LAW*) of Reg1 and Reg3 and the legal environment index (*LAW*) are 0.0003 and 0.001 respectively. The former coefficient is positive but not significant, and the latter is significantly positive at the 1% level. This indicates that compared with the pricing marketization stage, during the regulation stage (Reg3), the higher the degree of legalization during the pricing regulation period, the higher the firm's audit fees. This shows that IPO companies in regions with a better legal environment have a higher risk of being punished for violations of regulations, and have higher audit fees in the pricing regulation stage, but this effect is only reflected in the regulation stage of Reg3 (2012.04-2014.12).

Table 9 Regression results of legalization level and audit fees

VARIABLES	(1) Fee_rate
Reg1	0.001***
	(3.920)
Reg3	0.003***
	(5.970)
LAW	0.001***
	(2.635)
*Reg1*LAW*	0.000
	(1.078)
*Reg3*LAW*	0.001**
	(2.221)
LEV	-0.001
	(-0.536)
Current	0.000
	(1.065)
ROA	-0.013***
	(-7.339)
OCF	-0.003***
	(-2.626)
Size	-0.001***
	(-7.402)
Complexity	-0.001
	(-1.612)
Big4	0.001*
	(1.886)
Underwriter	-0.001***
	(-3.362)
Constant	0.026***
	(9.094)
Industry FE	YES
Observations	1134
R-squared	0.320

Note: *, **, and *** indicate significant levels at 10%, 5%, and 1%, respectively

5.3 Robustness tests

5.3.1 Test of Self-Selection Problem (PSM)

Regarding lower audit fees during the period of the pricing marketization stage, an alternative explanation is that in the pricing marketization stage, high-growth and better-performing companies are more likely to obtain higher valuations, so the managers of these companies are more inclined to go public during this period, thus raising the problem of self-selection of timing the listing. Ritter and Welch (2002) put forward the view of the IPO wave. The number of IPO companies has time and industry agglomeration, indicating that the managers of the IPO companies obtain a higher offering price, and may choose a time when the market is booming or investor sentiment is high click to launch an IPO. In the pricing marketization stage, high-growth and better-performing companies are more likely to obtain higher valuations, so these companies are more inclined to choose to go public during this period. These companies are less risky. The audit firms who conduct the IPO also bear fewer litigation risks and lower risk premiums. So, they charge lower audit fees. This is a challenge to the conclusion of this paper. The changes in audit fees in the three stages may be caused by the companies' choice of listing timing.

Furthermore, the timing for the IPO company to be listed is uncertain. It is unlikely to affect the timing of the IPO companies' listing. The reasons are as follows: (1) It takes at least one year for the IPO to apply for listing. It may take more time if there are policy factors such as the SEC's suspension of IPO or industry restrictions. Therefore, when a company decides to go public during the pricing regulation phase (*Reg1* and *Reg3*), it is unlikely for the managers to reject to be listed (Chen et al., 2018), it may take years for the company to be granted with IPO offer. (2) IPO is an important channel for early financial investors (such as VC, PE, etc.) to cash out and exit the company (Liu et al., 2021). Timely listing can help companies and venture capitalists achieve a win-win situation (Barry, 1994). Therefore, as the most profitable exit mechanism for financial investors, it is expected to receive the benefits by advising the company to go public as early as possible. Therefore, we believe that when the company has an IPO opportunity, the IPO company will take the opportunity rather than abolish it.

To explain this potential choice problem, we use propensity score matching (PSM) to match the listed companies by 1: 1 non-replace method matching the pricing marketization stage with the pricing regulation, to ensure the company features during three regimes as closely as possible. It can overcome the interference caused by the company's choice of listing time. Table 10 shows the regression results after propensity matching. This paper finds that Reg1 and Reg3 are still significantly positive at the 1% level, indicating that the results remain robust.

Table 10 Regression results after propensity score matching (PSM)

	(1)
VARIABLES	Fee_rate
Reg1	0.001***
	(5.680)
Reg3	0.004***
	(9.679)
LEV	-0.002
	(-1.155)
Current	0.000
	(1.086)
ROA	-0.021***
	(-7.624)
OCF	-0.003**
	(-2.110)
Size	-0.001***
	(-5.390)
Complexity	-0.001
	(-0.747)
Big4	0.001*
	(1.792)
Underwriter	-0.001***
	(-3.043)
Constant	0.028***
	(7.386)
Industry FE	YES
Observations	754
R-squared	0.302

Note: *, **, and *** indicate significant levels at 10%, 5%, and 1%, respectively

5.3.2 Placebo test

To test the impact of policy deviation on audit fees, this paper pushes the time of IPO pricing forward 500 days for a placebo test. Table 11 reports the coefficients of Reg1 and Reg3 are positive but not significant, which further validates the empirical results of this paper.

Table 11 Regression results of placebo test

VARIABLES	(1) Fee_rate
Reg1	0.082
	(0.285)
Reg3	0.056
	(0.494)
ROA	-1.421***
	(0.000)
Inv	-0.141*
	(0.084)
Rec	0.060
	(0.498)
Lev	-0.324
	(0.172)
Size	-0.118***
	(0.002)
Complexity	-0.005
	(0.755)
Big4	0.072
	(0.152)
Industry Dummy	YES
Constant	2.942***
	(0.001)
Observations	1,168
Adjusted R-squared	0.188

5.4 Endogeneity test

There are two views on the role of audit in IPO pricing, those are "information effect" and "signal effect" (Titman and Trueman, 1986, Chang et al., 2008). Among them, the view of the "signal effect" shows that hiring high-quality audit services is a signal to investors that the company's financial performance is of good quality. Therefore, a possible alternative explanation is that during the pricing regulation stage, potential Non-Big4 clients would choose international Big4 audit firms to meet the requirements of the company's directors and external investors, and therefore send a signal to the market that the company is in good condition. Big4 brings a reputation premium through its international brand (Lennox et al., 2016). On the other hand, IPO companies are willing to pay higher audit fees to purchase auditors' opinion, which is reflected by the high tolerance of auditors to the client's earnings management behavior resulting in biased audit opinion (Abbott, Parker and Peters, 2006). Therefore, the mismatch between clients and firms can lead to changes in audit fees, which will challenge our conclusions. In this regard, we refer to the practice of Shu (2000) and select the company's operational and financial indicators to establish a logit model for the matching degree between the client and the firm.

$$Big4=\beta_0+\beta_1*Size+\beta_2*Aturn+\beta_3*Crr+\beta_4*Lev+\beta_5*ROA+Industry\ Dummy+YearDummy \quad \text{(III)}$$

In model (III), all variables except *Aturn* are listed in Table 3. *Aturn* is the turnover rate of

total assets. We use the model (III) to obtain the fitted value of the dependent variable to estimate the probability (EP) that the IPO companies will hire Big4. In this paper, the EP obtained is divided into two groups according to the selected firm (BIG4), and then we construct kernel density function distribution chart to obtain a critical probability that minimizes the sample error probability is 0.035. If the clients' estimated probability is greater than the critical value, the client is considered a potential Big4 client, otherwise a Non-Big4 client. And we set the variable *Match*, if the estimated probability is greater than the critical probability, *Match* is 1, otherwise is 0. Next, we compare the obtained *Match* variable with the Big4 variable and set the *Mismatch* variable. If the *Match* variable is not equal to *Big4*, we consider that there is a mismatch between the firm and the client. *Mismatch* is set to 1, otherwise is 0. At the same time, in order to test the alternative hypothesis (the potential client of Non-Big firm chooses Big4 firm), set the *Missup* variable. If *Big4* and *Mismatch* are both 1, *Missup* is set to 1, otherwiseis 0. The definitions of the specific variables are listed in Table 11. Finally, we substitute *Mismatch*, *Missup*, and *Missdown* into the model (I) for testing. The regression results are shown in Table 12. Column (1) is the regression that includes *Mismatch*. The coefficient of *Mismatch* is not significant, which indicates that the impact of audit mismatch on audit fees of IPO is not found in this model. Column (2) is the regression with *Missup* and *Missdown* added. The *Missup* coefficient is -0.003, significantly negative at the 1% level. But the *Missdown* coefficient in this model is not significant, indicating that when potential non-four clients in choosing the big four firms, the IPO audit fees will not be higher, which negates the alternative explanation proposed by the IPO firms to obtain a higher valuation, hired big four Firms to send signals that the company is in good condition to the market, leading to higher audit fees.

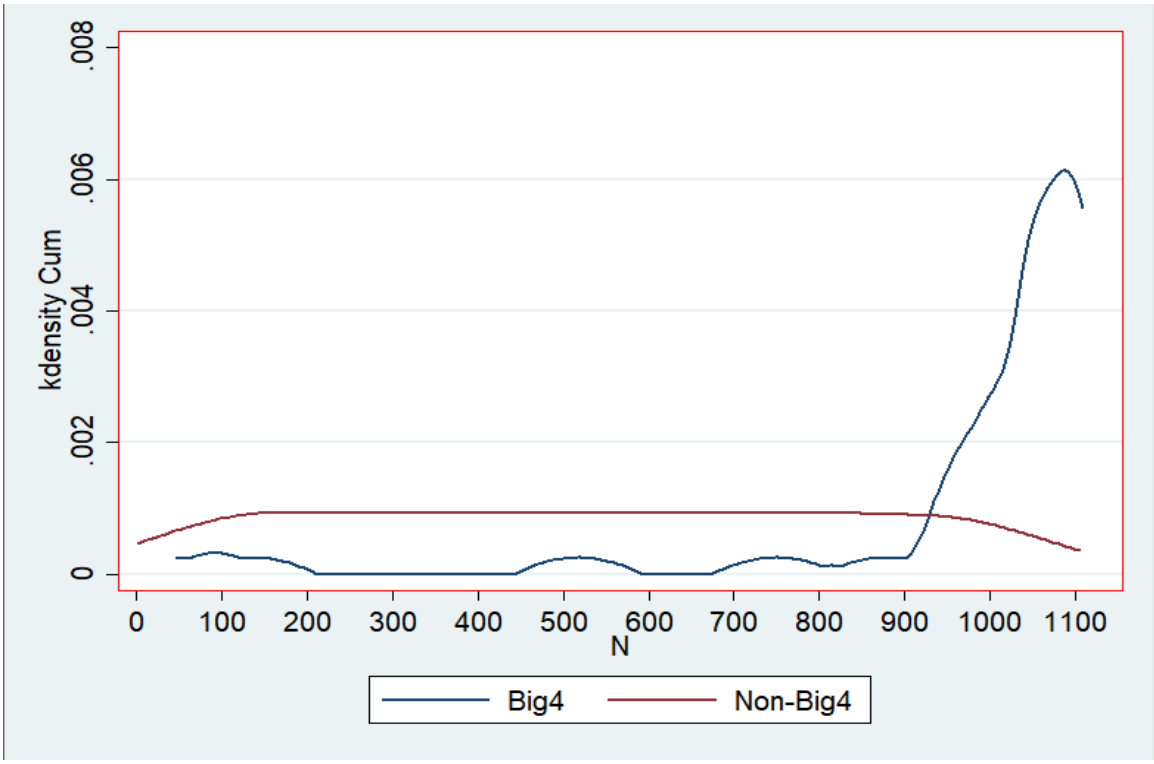

Figure2 the Kernel Density Map for Firm Selection

Table 12 Regression results of client and auditor matching

Panel A variable definition table

Variable-name	Variable	Variable definitions
Probability estimation	*EP*	Variable fit value obtained from model (III)
Critical probability	*CP*	Obtained by grouping EP and using kernel density function distribution map
Potential choice	*Match*	If EP is greater than CP, Match takes 1; otherwise 0.
Client and audit	*Mismatch*	Take 1 if Match variable is not equal to Big4, otherwise 0
Upward mismatch	*Missup*	If Big4 and Mismatch are 1 at the same time, Missup is set to 1, otherwise 0.
Downward mismatch	*Missdown*	If Big4=0 & Mismatch=1, Missdown is 1, otherwise 0

Panel B regression results

	(1)	(2)
VARIABLES	Fee_rate	Fee_rate
Reg1	0.001***	0.001***
	(5.602)	(5.185)
Reg3	0.004***	0.004***
	(10.271)	(10.040)
LEV	-0.001	-0.000
	(-0.507)	(-0.445)
Current	0.000	0.000
	(1.284)	(1.319)
ROA	-0.013***	-0.013***
	(-7.543)	(-7.863)
OCF	-0.003**	-0.003**
	(-2.406)	(-2.232)
Size	-0.001***	-0.001***
	(-6.613)	(-6.640)
Complexity	-0.001	-0.001
	(-1.189)	(-0.976)
Big4	0.001**	0.002***
	(2.097)	(2.869)
Underwriter	-0.001***	-0.001***
	(-3.351)	(-3.352)
Missmatch	-0.000	
	(-0.225)	
Missup		-0.003***
		(-3.386)
Missdown		0.000
		(0.884)
Constant	0.026***	0.028***
	(8.683)	(8.492)
Industry FE	YES	YES
Observations	1,134	1,134
R-squared	0.286	0.290

Note: *, **, and *** indicate significant levels at 10%, 5%, and 1%, respectively

6. Further analysis

Why do audit firms charge higher audit fees for IPO companies during the pricing regulation stage? To answer this question, we would like to compare the risks of the IPO companies under IPO pricing regulation and marketization by studying whether there are differences in their operating performance and violations after IPO, to explain the different audit fees for IPO. The inspection mechanism is as follows: (1) Inspection of pricing regulation and performance reverse and (2) Inspection of pricing regulation and corporate violations. The inspection of pricing regulation and performance reverse means during the period of pricing regulation, the P/E ratio is regulated, and IPO companies may make high profits through upward earnings management to obtain a higher offering price. Since accrual earnings management is not sustainable (Kothari et al., 2005), if a company performs more earnings management before the IPO, the company's performance will inevitably decline or even reverse in the future. This phenomenon is called “Bian Lian” (Yang, 2013). Therefore, compared to the pricing marketization stage, companies listed in the pricing regulation stage are more likely to appear performance reverse. The inspection of the pricing regulation and the corporate violations. Newly listed companies are often closely watched by regulators, the media, and public investors, making it easier for companies’ negative information and violations to be discovered, and then be punished by administrative institutions. If the listed company has more earnings management before the IPO, it means that the company's information transparency and quality are worse (Aerts and Cheng, 2011). After these companies go public, their negative information is also more likely to be exposed, leading to regulatory intervention and administrative penalties. Therefore, compared to the pricing marketization stage, companies listed in the pricing regulation stage are more likely to be punished for violations. The specific inspection is as follows.

6.1 Pricing regulation and performance reverse

For the measurement of performance turnaround, we refer to Yang (2013) and set the *DEARN* variable. If the company's operating profit in the year of the IPO is lower than the year before the IPO, it is 1, otherwise is 0.

This paper uses the Logit model to test the relationship between performance reverse and pricing regulation. Table 13 reports the regression results. The coefficient of *Reg1* is 1.077. The coefficient of *Reg3* is 1.851, both of the coefficients remain significant at the level of 1%. This indicates that compared with the pricing marketization stage, the possibility of performance reversal in the regulatory stage is greater. The possibility of a higher performance turnaround means that the earnings quality of listed companies in the regulatory stage is lower.

Table 13 Impact of pricing regulation on performance reverse

VARIABLES	DEARN	
	Coefficient	Marginal Effect
Reg1	1.076***	0.050***
	(3.002)	（2.902）
Reg3	1.851***	0.087***
	(5.431)	（4.982）
LEV	0.817	0.038
	(0.544)	(0.547)
Current	0.332***	0.016***
	(2.635)	(2.599)
ROA	-6.069*	-0.284*
	(-1.677)	(-1.664)
OCF	0.769	0.094
	(0.359)	(0.883)

Size	0.311**		0.015**
	(1.990)		(1.972)
Complexity	-0.188		-0.009
	(-0.188)		(0.194)
Big4	-2.229**		-0.104**
	(-2.036)		(-2.019)
Underwriter	0.064		0.003
	(0.223)		(0.223)
Constant	-10.201**		0.026***
	(-3.117)		(9.581)
Observations		1,134	
Pseudo R-squared		0.1187	

Note: *, **, and *** indicate significant levels at 10%, 5%, and 1%, respectively

6.2 Pricing regulation and penalty

For the company that is subject to administrative penalties because of violations of their performance, we measure it as follows: (1) Download the corporate violation information from CSMAR. (2) Through sorting and discussion, determine the following types(false listing of assets, false records, material omissions, false disclosures, fraudulent listing, capital violations, unauthorized changes in the use of funds, occupation of company assets, illegal guarantees, etc.) as violations related to the IPO, and keep samples of these types of violations. (3) To make the violations more relevant to the company's IPO, this paper only keeps a sample of the violations that occurred in the company within three years after the IPO. And set the *Punished* variable. If the company violates the above type within three years after the IPO and is punished, it is 1; otherwise is 0. For those companies which may be punished with multiple violations, the *Punished_fre* variable is used to count the penalties of the company.

Regarding the research on pricing regulation and penalty for violation after IPO, this paper uses Logit and OLS models to test the relationship between pricing regulation and penalty (*Punished*、*Punished_fre*). Table 14 reports the regression results. Column (1) and（2）is the regression result of pricing regulation and whether the enterprise is punished. Among them, the coefficient of *Reg1* is 0.010, but it is not significant; the coefficient of *Reg3* is 0.825, and the marginal effect coefficient is 0.069. Both of these are significantly positive at the 1% level, indicating that compared to the pricing marketization stage (*Reg2*), companies listed in the pricing regulation stage (*Reg3*) are more likely to be fined for violations. Column (3) is the regression of pricing regulation and penalty frequency. The coefficient of *Reg1* is -0.002, but it is not significant; the coefficient of *Reg3* is 0.139, significantly positive at the 1% level, indicating that companies listed in the pricing regulation stage (*Reg3*) are penalized more often than those listed in the pricing marketization stage (*Reg2*). In summary, the companies listed in the pricing regulation stage are more likely to be punished for violations, which indicate that the quality of companies listed in the pricing regulation stage is worse. In addition, among the regressions columns, the coefficient of *Reg1* is not significant, while the coefficient of *Reg3* is very significant. This may be caused by the improvement of the capital market environment and stricter supervision in recent years.

Table 14 Pricing regulation and company penalty for violation[5]

	Punishment		
	（1）	（2）	（3）
Variables	Coefficient	Marginal Effect	Coefficient
Reg1	0.010	0.001	-0.002
	(0.035)	(0.035)	(-0.079)
Reg3	0.825***	0.069***	0.139**
	(3.026)	(3.000)	(2.504)
LEV	0.901	0.075	0.053
	(0.654)	(0.653	(0.371)
Current	0.125	0.010	0.014
	(1.218)	(1.215)	(1.091)
ROA	-0.652	-0.055	-0.321
	(-0.231)	(-0.231)	(-1.110)
OCF	0.982	0.082	0.138
	(0.645)	(0.645)	(0.752)
Size	-0.017	-0.001	-0.005
	(-0.129)	(-0.129)	(-0.377)
Complexity	0.305	0.026	0.075
	(0.364)	(0.364)	(0.688)
Big4	-0.429	-0.036	-0.033
	(-0.625)	(-0.625)	(-0.491)
Underwriter	0.070	0.006	0.007
	(0.332)	(0.332)	(0.281)
Constant	-2.912		0.147
	(-1.201)		(0.611)
Observations		1134	1134
R-squared			0.012

Note: *, **, and *** indicate significant levels at 10%, 5%, and 1%, respectively

7. Conclusion

Based on the IPO companies in China's A stock market from June 19, 2006 to May 4, 2014 as a sample, combined with the change of IPO pricing mechanism, this paper studies the influence of IPO pricing regulation on audit fees. Due to the pricing regulation, IPO companies will increase EPS through earnings management, which will increase the risk of misstatement in the financial reports of IPO companies. To compensate for potential risks, reputational losses, and increased audit costs, the audit firm will charge higher audit fees. The research results show that compared with the pricing marketization stage, the IPO audit fees of the pricing regulation stage are higher; compared with state-owned enterprises, audit firms in the pricing regulation stage charge higher fees for the private enterprises. In regions with higher legal level, IPO audit fees are higher in the pricing regulation stage. Further research shows that IPO companies in the pricing regulation stage are more likely to reverse its performance and have a higher probability of being penalized after IPO.

The research of this paper has the following implications. Firstly, the research of this paper

[5] In some industries, Punish's value is 0 or 1. Using Logit regression will result in missing samples, so the industry is not controlled in the regression

reveals the impact of government's IPO pricing regulatory mechanism on audit fees and helps regulators to reconsider the effectiveness of price regulation. Secondly, it provides a basis for investors to judge the value of IPO companies. Investors mainly understand the IPO enterprises through the prospectus and media reports before listing, and judge the value of the enterprises based on the financial data in the prospectus, and then make investment decisions according to the information. The results of this paper enlighten the investors to consider whether the company's IPO pricing is regulated as an important content when judging the company's value. Finally, IPO pricing mechanism affects the allocation of resources in the capital market. With the implementation of IPO pricing regulation and the setting of price cap, some companies will not be able to set offering price according to their market value, or even conduct earnings management in order to obtain more financing, which leads to inefficient allocation of resources in the capital market. But deregulating prices could also lead to high offering price, IPO excessive financing and high P/E ratios. Therefore, in order to improve the efficiency of capital market allocation, the regulatory authorities still need to explore and balance the two aspects.

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