

Carbon Information, Financial Opacity and Audit Pricing--Based on the Panel Data of Listed Company Joined the Carbon Disclosure Program in China

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Abstract

This paper using the companies joined the CDP project in China from 2008 to 2013 examines the voluntary disclosure of the carbon information in which way influence the audit pricing and the transparency of the listed companies in China. We find that :(1) after voluntary disclosure the carbon information , the audit fee is significantly positive correlated with the disclosure information; (2)disclosure of the carbon information mitigate the opacity of the company. The higher transparency of enterprises, the negative correlation between the carbon disclosure and the audit fee is more significant.

Keywords: Carbon information; voluntary disclosure; financial information transparency; audit pricing

1.1 Background

As the society and the investors play close attention to the environment, some of the listing corporations in China increased the investment in the environment. They paid more in the equipments applied for the environmentally friendly production; meanwhile environmental related information disclosure also has a great progress. This is worth mentioning is that since 2008, some of the listed companies voluntarily participated in the international non-profit organization launched Carbon Disclosure Program (CDP) and more and more listed companies joined in the following years. Since the carbon information disclosed in CDP belongs to the extra information of voluntary disclosure, it will not only increase the financial cost, also may generate related litigation risks. Following Simunic(1980)'s audit pricing theory, audit fees mainly included the three aspects:(1) the cost paid by auditors to perform the audit procedures; (2) for the customer audit risk (such as financial misstatements etc.) and the corresponding cost of the expected loss; (3) normal profit of auditors' office. Houston (1999) proposed that the audit pricing should be decided by the litigation risk of the material misstatements and the non-audit risks which was not related to the material misstatements. In all, the research question of this paper is that the determinants of audit fee of the companies joined in the CDP.

1.2 Audit Pricing

Simunic (1980) proposed that audit fees were determined by the size, industry, financial leverage, earnings, and audit opinion of the listed companies. Walker, and Westergard Johnson (1995) in the article showed that the size of the auditor's office had a significant impact on audit fees. Taylor and Baker (1981) found that the complexity of the business and the size of the company had a decisive impact on the audit fees. Venkataraman et al (2008) found that the audit fees of company's the first IPO were significantly higher than the audit fees after IPO period, furthermore the higher of the client's litigation risk, the higher of the audit fees. Doogar et al (2010) rose that risk oriented audit approach helps auditors to improve audit efficiency, consisted as lower audit fees and more targeted audit pricing.

Wang Pingxin, Li Buxi (2005) found that the size of the listing Corporation, ROA, financial leverage and other factors could directly affect the audit fees. Zhang Jixun and Xu Yi (2005) showed that the following factors strongly related to audit fees: company size, the complexity of the business, regions of the company registered.

Han Houjun, Zhou Chunsheng (2001) found that the customer's total assets, financial leverage, the audit opinion were significantly correlated with the audit fees. Pan Keqin (2008) in the article pointed out that the listing Corporation's corporate governance index and audit pricing has a significant negative correlation.

1.3 Information Transparency and Audit fee

Danielsen et al (2007) tested two hypotheses related to audit pricing and transparency of client's company and found that auditors considered the information transparency risk of the clients as a risk premium reflected in the audit fees. Chen Xiaolin (2009) applied 799 listed company data in China, adopting the guarantee, the possession of the block shareholders and information transparency as the proxy to test how auditors responded to the audit risks. They found that the higher the transparency of information disclosure of the company, the lower the risk associated with the audit, then the lower the audit fees. Xue Minzheng et al. (2009) chose the listing Corporation in Taiwan area as the research object, using Heckman (1979) two stage analysis, after the empirical research, they found that the higher the information transparency of listing Corporation, the higher the audit fees. Furthermore, they believed that the higher the company's information transparency, the auditor would need to put in a relatively more audit input.

2. Hypothesis Development

Chen Xiaolin (2009) put forward the guarantee, information disclosure transparency and audit fees have a significant positive (negative) correlation. Xue Minzheng et al (2009) found that audit fees and information transparency was significantly positive correlated. The literature indicates that in the audit pricing, the potential audit risk will be taken into account the audit pricing. The first hypothesis is presented in this paper:

H1a: companies that disclose carbon information, along with higher audit fees.

Since the international Big 4 required much higher in the related audit risk and more sensitive to the risk, we rise the following assumption:

H1b: in the enterprises disclosed carbon information, the relationship between carbon information disclosure and audit fees is more significant in clients of the international big 4.

The higher transparency of the listed companies, following with the lower information asymmetry and better corporate governance, which means that the cost of capital will be much lower so that increase the value of the company. For customers with high information transparency, since the better governance situation, the auditors input could be relatively reduced and then the audit fees is much lower. In addition, Welker (1995) found that information transparency can alleviate the problem of the Information asymmetry between insiders and external stakeholders. With the clients has high level of the information transparency, the auditors think that the creditability and the transparency of the financial statements would be higher. From this point of view, customers pay lower audit fees. Based on the analysis above, the paper puts forward second hypotheses:

H2: voluntary disclosure of carbon information, easing the low transparency of financial information resulting in higher audit fees.

3. Sample and Descriptive Statistics

3.1 Data

In this paper, we selected the listed companies in China to fill out the CDP questionnaire in 2008-2013. Sample firms are the 100 largest companies in the market value in China each year, excluding B shares, H shares; lack of financial data of the company, the final sample size is 528. The data of this paper comes from two parts :(1) the WIND and the CSMAR database; (2) Manual extraction of CDP report in the case of carbon information reply status.

3.2 Variables

3.2.1 Audit fee and CDPR

We focus on that whether the carbon information disclosure is one of the determinants to the audit pricing. To examine the audit pricing, we use a variable for audit pricing as AUDFEE, which is the natural logarithm of the listing company to pay audit fees. Explanatory variable is CDPR, CDP reports of participation. When the enterprise involved in the CDP project, reply or provide information, the value is 1, and otherwise the value is 0.

3.2.2 Earnings Aggressive

In this paper, Earnings Aggressiveness Measure is used to measure the financial transparency of the company. Earnings Aggressiveness (EA) is the possibility that the company confirm income in advance and hysteresis to recognize loss. Bhattacharya (2003) used total accruals as the proxy of EA. However, due to the total accruals constitute by normal accruals and abnormal accruals (earnings management), it is inappropriate to use total accruals as the proxy. In this paper, we use the method in Wang Yan and Chen Hanwen (2006), adopting the discretionary accruals (DA) as the proxy of earnings aggressive (EA), to measure the company's financial transparency. Jeter and Shivakumar(1999) found that put variable of the net cash flows in operating activities in the Jones model and the estimated DA was more accurate. Kothari, Leone and Wasley(2005) introduced the variable of operating performance in the model to control the influence of the company performance to the DA. Kang and Sivaramakrishnan(1995) in the article proposed revenue, expenses and fixed assets are the main factors that determine the company's profit. Considering the company could positive or negative control the accruals, in this paper, we prefer to use the absolute number of DA as the proxy for the EA.

Firstly, we use the 2008-2013 company's cross section data to regression:

$$TA_{i,t} / A_{i,t-1} = \alpha_1 (1 / A_{i,t-1}) + \alpha_2 (\Delta REV_{i,t} / A_{i,t-1}) + \alpha_3 (PPE_{i,t} / A_{i,t-1}) + \alpha_4 (\Delta EXP_{i,t} / A_{i,t-1}) + \alpha_5 (ROE_{i,t-1} / A_{i,t-1}) + \alpha_6 (CF_{i,t} / A_{i,t-1}) + \mu_{i,t} \dots (1)$$

we got :

$\hat{\alpha}_1, \hat{\alpha}_2, \hat{\alpha}_3, \hat{\alpha}_4, \hat{\alpha}_5$, by using model2, Get the company i's normal accrual profit NDA.

$$NDA_{i,t} = \hat{\alpha}_1 (1 / A_{i,t-1}) + \hat{\alpha}_2 (\Delta REV_{i,t} / A_{i,t-1}) + \hat{\alpha}_3 (PPE_{i,t} / A_{i,t-1}) + \hat{\alpha}_4 (\Delta EXP_{i,t} / A_{i,t-1}) + \hat{\alpha}_5 (ROE_{i,t-1} / A_{i,t-1}) + \hat{\alpha}_6 (CF_{i,t} / A_{i,t-1}) + \mu_{i,t} \dots (2)$$

在Then, the DA should be calculated DA=TA/A-NDA.

Secondly, calculate the earnings aggressiveness of each company, EA=|DA|.

From the calculation process of EA, EA is the absolute value of discretionary accrual, so its value is inversely related to the transparency of accounting information. That is, the greater the EA, the greater the company's discretionary accrual, the lower the transparency of accounting information.

In this paper, we apply the company size, beta, business risk(Operisk), financial risk(LEV), book to market(B/M), profitability(ROA), industry(ind),Big4 and audit opinion(Mod) as control variables.

3.3 Descriptive Statistics

TABLE 1 Descriptive Statistics
Panel A: CDP carbon information disclosure

Year	Non-disclosure	Disclosure (fill in or provide information)	Sum
2008	92	8	100
2009	83	17	100
2010	70	30	100
2011	58	42	100
2012	84	16	100
2013	73	27	100
Total	460	140	600

Panel B: main variables and descriptive statistics

Variable		No. Of obs	Min	Mean	Max	Std.dev
AUDFEE	Audit fees, the natural logarithm of the listing Corporation to pay audit fees	528	13.122	14.893	18.064	1.321
CDPR	Dummy variable, whether the disclosure of carbon information; then the disclosure of =1, otherwise =0	528	0	0.220	1	0.414
MOD	Dummy variable, Audit opinion: unqualified opinion=1; otherwise=0	528	0	0.0057	1	0.075
BIG4	Dummy variable, Listed company audit by international Big4, yes=1; no=0	528	0	0.314	1	0.465
EA	Transparency of financial information, the greater the value, the lower the transparency	340	0	0.044	0.334	0.058
EA_D	EA ten equal parts, Increased by 1-10, step by step. When EA>=8, EA_D=1, on behalf of the poor financial transparency; When EA_D<=3, EA_D=0, represents a high degree of financial transparency.	203	0	0.493	1	0.5014
Beta	market risk	528	0.504	1.077	1.710	0.339
Oprisk	operating risk	528	0.001	0.028	0.097	0.025
Lev	financial leverage	528	0.223	0.592	0.945	0.221
BM	Book to market ratio	528	0.172	2.757	14.407	3.932
Roa	Corporate profitability	528	0.004	0.064	0.178	0.053
Size	Scale, natural logarithm of total assets	528	22.080	24.891	28.798	1.921

According to the panel A in table 1, the amount of carbon information disclosure is increasing year by year, need to be explained is the special situation in 2012. Because the replacement of the CDP project information release partner, resulting in the change of information disclosure. During 2008 - 2011, the former partner disclosed the company both filled in the questionnaire and supplied information. But in 2012-2013, the new partner just disclosed the companies which filled in the questionnaire only. This could explain the big decline trend in 2012. Overall, the carbon disclosure company is increasing; companies began to focus on the CDP.

The main research question of this paper is whether CDPR (voluntary disclosure of carbon information) can affect the audit fees by improving the information transparency of company. In table2 panel B, we found that the maximum value of the index of corporate information transparency is 0.334, mean value is 0.044; it indicated that the information transparency of the sample company was good.

4. Empirical Analysis

4.1 Empirical Model

4.1.1 Following two models, to test the hypothesis H1a and H1b:

$$AUDFEE_{it} = \beta_0 + \beta_1 * CDPR_{it} + \beta_2 * SIZE_{it} + \beta_3 * LEV_{it} + \beta_4 * BM_{it} + \beta_5 * ROA_{it} + \beta_6 * OPRISK_{it} + \beta_7 * IND_{it} + \varepsilon_t \dots (3)$$

$$AUDFEE_{it} = \beta_0 + \beta_1 * CDPR_{it} + \beta_2 * CDPR_{it} \times BIG4_{it} + \beta_3 * BIG4_{it} + \beta_4 * BM_{it} + \beta_5 * ROA_{it} + \beta_6 * OPRISK_{it} + \beta_7 * IND_{it} + \beta_8 * SIZE_{it} + \beta_9 * LEV_{it} + \varepsilon_t \dots (4)$$

Where the dependent variable is AUDFEE, the main explained variable is CDPR. This paper also considers the determinants of audit pricing proposed by Simunic(1980), which argued that the audit fee is determined by the listing corporations' size, industry, leverage earnings, audit opinion and other factors.

4.1.2 Following two models, to test the hypothesis H2:

$$AUDFEE_{it} = \alpha_0 + \alpha_1 * CDPR_{it} + \alpha_3 * EA_D_{it} + \alpha_4 * SIZE_{it} + \alpha_5 * LEV_{it} + \alpha_6 * BM_{it} + \alpha_7 * ROA_{it} + \alpha_8 * OPRISK_{it} + \alpha_9 * IND_{it} + \alpha_{10} * MOD_{it} + \alpha_{11} * BIG4_{it} + \delta_t \dots (5)$$

$$AUDFEE_{it} = \alpha_0 + \alpha_1 * CDPR_{it} + \alpha_2 * CDPR_{it} \times EA_D_{it} + \alpha_3 * EA_D_{it} + \alpha_4 * SIZE_{it} + \alpha_5 * LEV_{it} + \alpha_6 * BM_{it} + \alpha_7 * ROA_{it} + \alpha_8 * OPRISK_{it} + \alpha_9 * IND_{it} + \alpha_{10} * MOD_{it} + \alpha_{11} * BIG4_{it} + \delta_t \dots (6)$$

In the above two models, the explanatory variables are consistent with the model 3,4; we add the EA_D as the proxy of the financial transparency in the model to test the influence of corporate financial transparency on the relationship between audit fees and carbon information disclosure. We expect the financial transparency has a significant impact on the relationship between the two factors, shows as the higher degree of the financial transparency, the negative relationship between carbon information disclosure and the audit fee is more significant.

4.2 Empirical Result

4.2.1 Audit fee and CDPR

The paper used model3 and panel data to carry on the multiple regressions. Based on the result of Table2 panel A column (1)-(2), we find that CDPR and Audit fee has a significantly positive relationship (0.288, 2.63***). This implied that according to the information transmission theory and audit pricing theory, the auditors pay attention on the voluntary disclosure of the carbon information and take the potential legal risk and other risks of carbon information disclosure into account to convert to the corresponding audit risk premium. To this point, the auditors count this part of audit risk premium and increase the audit fees. The result of the empirical study consists with the expected result of this paper, it illustrates when the auditor is pricing the customer, the company joined the CDP program receives higher audit fees due to the related audit risk. Compared with the listing company that did not disclosed carbon information, the audit fee of the company disclosed the carbon information was significantly increased by 28.8%. The empirical results support the hypothesis proposed by H1a, the voluntary disclosure of carbon information will increase the audit risk and the auditors also consider the risk reflected in the higher audit fees.

4.2.2 Audit fee, CDPR and Big4

The empirical model 4 tests the impact of voluntary disclosure of carbon information on the audit fees of big 4 and non-big4. According to the empirical results of Table2 panel A column (3)-(4), the interaction of CDPR and the big4(CDPR*BIG4) and the audit fee has a significantly positive relationship at the level of 5% (0.484, 2.40**). It implies that the auditors will convert the voluntary carbon information disclosure of the customer into the audit risk and increase the audit fees, but this result is different between the big4 and non big4 auditors. Compared with the company employed the non big 4 auditors, the companies disclosed carbon information employed the big 4 auditors will be charged more 48.4% of audit fees. This is consisted with the H1b expected, it illustrates that the big 4 auditors are more cautious in the potential litigation risks of customers.

TABLE 2 Empirical Result
Panel A: Audit fee and CDPR

	(1)	(2)	(3)	(4)
	AUDFEE		AUDFEE	
Variable	coef	tstat	coef	tstat
cdpr	0.288	2.63***	0.063	0.44
cdpr_big4			0.484	2.40**
big4	0.531	5.08***	0.395	3.34***
mod	0.223	0.43	0.200	0.38
beta_w	-0.157	-1.30	-0.152	-1.26
size_w	0.499	14.60***	0.503	14.79***
lev_w	-0.946	-3.11***	-0.951	-3.15***
roa_w	-1.305	-1.23	-1.213	-1.15
oprisk_w	-1.786	-0.95	-1.604	-0.85
Constant	3.116	3.81***	3.039	3.74***
R-squared	0.721		0.726	

*** p<0.01, ** p<0.05, * p<0.1

Panel B: Audit fee, CDPR and Financial Transparency

	(1)	(2)	(3)	(4)
	AUDFEE		AUDFEE	
Variable	coef	tstat	coef	tstat
cdpr	0.113	0.86	0.561	2.01**
EA_D	-0.314	-1.76*	-0.190	-1.02
cdpr_EA_D			-0.824	-1.86*
big4	0.827	5.86***	0.791	5.63***
mod	0.176	0.25	0.231	0.32
beta_w	-0.077	-0.27	-0.061	-0.22
size_w	0.569	8.84***	0.508	7.27***
lev_w	-1.564	-2.16**	-1.123	-1.51
roa_w	-3.593	-1.59	-2.642	-1.13
oprisk_w	-0.139	-0.03	-0.412	-0.10
Constant	2.074	1.41	3.115	2.03**
R-squared	0.635		0.654	

*** p<0.01, ** p<0.05, * p<0.1

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4.2.2 Audit fee, CDPR and Financial Transparency

According to the regression results of mode 5 and 6, Table2 panel B column (1) -(2), the empirical results support the H2. The information transparency of the listed company and the audit fee has a significant negative relationship at 10% level (-0.314, -1.76*). This implies that the higher degree of the information transparency of the company, the lower of the audit fees charged. According to the column (3) -(4), the interaction of carbon information and information transparency (CDPR*EA_D) and the audit fee is significantly negative correlated at 10% level (-0.824, -1.86*). This result means that the worse the transparency of financial information, the more significant of the negative relationship between CDPR and audit fees. Compared with the company disclosed non carbon information, the company voluntarily disclosed carbon information was considered as the situation that mitigated the information asymmetry and decreased the audit risks due to the information asymmetry, as a result, the company would be charged much lower audit fees. In short, the statistical evidence shows that carbon information disclosure increases the information transparency of the company to reduce the audit fees due to the high information asymmetry.

5. Conclusion

This paper takes the Chinese enterprises joined in the CDP project from 2008 to 2013 as the sample, applying the audit pricing theory and tests how the voluntary disclosure of carbon information affects the audit fees. We find that the auditors will pay attention to the company voluntarily disclosing the carbon information in the CDP project and take the potential legal risk due to the information disclosed into account in the audit risk, which will increase the audit risk premium, performing as much higher audit fees. Secondly, we find the company with high information transparency, carbon information disclosure significantly positive correlates with the audit fees; while the company with lower information transparency, it will increase the information transparency due to reducing the information asymmetry by disclosing carbon information. Therefore, to a certain extent, the disclosure of carbon information will decrease the audit fees.

To a certain extent, the empirical results of this paper proved the audit pricing theory and the auditors will pay attention to the company voluntarily disclosing carbon information. For the company with the poor information transparency and the high degree information asymmetry, the company will be charged lower audit fees while it voluntarily disclosed carbon information. This shows that voluntary disclosure of carbon information does have a certain signal transfer function; it indicates that the company is trying to reduce the degree of information asymmetry. This will bring benefits to the company, such as much lower cost of capital and lower audit fees.

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