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AUDITOR CHOICE AND INSTITUTIONNEL INVESTOR CHARACTERISTICS AFTER THE ENRON SCANDAL IN THE FRENCH CONTEXT

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Résumé

Cette étude s'intéresse à la relation entre la qualité d'audit et les caractéristiques des investisseurs institutionnels dans le contexte français. Après le scandale d'Enron, la perception des investisseurs institutionnels envers les Big 4 a changé. Notre première hypothèse s'intéresse à la relation entre la propriété institutionnelle et le choix des Big 4. Alors que notre deuxième hypothèse s'intéresse à la perception des investisseurs institutionnels étrangers et la désignation au moins d'un auditeur des Big 4 après le scandale d'Enron et le manque de protection des investisseurs institutionnels en France par rapport aux pays du *common Law*. Pour tester nos hypothèses, nous faisons recours aux données de 144 entreprises cotées sur le SBF 250 obtenues auprès de la base donnée Worldscope entre 2000 et 2007. Les résultats empiriques montrent qu'il y a une relation négativement significative entre les investisseurs institutionnels français et le choix d'au moins un Big 4 après le scandale d'Enron. Par contre, cette relation est positivement significative entre les investisseurs institutionnels étrangers et la désignation d'au moins d'un Big 4 après 2002.

Mots clés : Qualité d'audit, choix de l'auditeur, investisseurs institutionnels, scandale d'Enron.

Abstract

This study examines the association between the quality of audit and the characteristics of institutional investors, using French data. After the Enron scandal, the perception of the Big 4 by French institutional investors changed. Our first hypothesis focuses on the perception French institutional investors to appointment of the Big 4. Our second hypothesis deals with the perception of the foreign institutional investors to choose one of the Big 4 auditors due to the lack of investor protection in France and the failure of Enron. We tested our hypotheses on a sample of 144 companies listed on SBF 250, using *Worldscope* data over the period 2000-2007. Empirical results show a negative and statistically significant link between the choices of one of Big 4 auditor by French institutional investors after the Enron scandal, whereas there is a positive and statistically insignificant link between the foreign institutional investor and the Big 4 appointment after 2002.

Key Words: *Audit quality, auditor choice, institutional investor, Enron scandal.*

1. Introduction

Previous research shows that there has been much debate over audit quality. DeAngelo (1981) defines audit quality as the probability that the auditor will both detect and report a breach in the contract to provide fair accounting information. However, recent empirical researchers suggest that big audit firms guarantee audit quality. Becker *et al.* (1998) found that the firms audited by Big 4 had lower discretionary accruals in the United States than the firms audited by Non-Big 4. Palmrose (1988) analysed the relation between the audit litigation and the audit service quality. He reported that audits by the Big 4 (*ex-Big 8*) were less likely to result in litigation. In summary, audit quality is associated to the Big 4 brand name.

The failure of Enron was announced at the end of 2001. Andersen Houston Office played a significant role in this scandal. Three reactions were noted after this failure. The first one concerns the reaction of the financial market. Cahan and Zhang (2006) studied the reaction of the share price of Andersen's clients in 521 firms in 38 different countries outside the United States. They noted that share prices reacted negatively between December 12, 2001 and February 4, 2002. The second reaction is associated to the Big 4 brand name. The Big 4 lost their reputation after this scandal. Otherwise, the perception of the service offered by the Big 4 by investors changed after the Enron scandal. The third reaction concerns the legislative sector. In 2002, the United States adopted the Sarbanes-Oxley Act. This law establishes new procedures of corporate governance and search to guarantee the auditor independence in United States context. In France, a similar law related to financial security was passed in 2003.

The goal of this paper is to study the relationship between the characteristics of institutional investors and audit quality in France after the Enron scandal. Empirical results make a major contribution to auditing literature. We find a negative relation between French institutional investors and Big 4 appointment after the Enron collapse. This means that, if the French institutional investor has a majority ownership, the probability of hiring the Big 4 decreases after the Enron scandal. We also find an insignificant positive relation between the choice of the Big 4 and foreign institutional investors in France after Enron's failure. This result confirms that foreign institutional investor perceived Big 4 as the suppliers of audit quality even after Enron failure at the end of 2001.

The remainder of this paper is organised as follows. Section 2 describes the legal audit reforms after the Enron scandal in France. Section 3 develops hypotheses concerning the

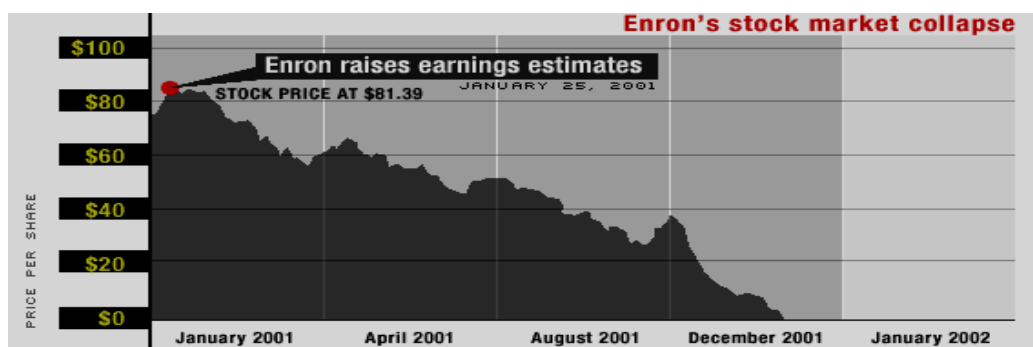
choice of auditors and the characteristics of institutional investors in France. Section 4 presents the sample and methodology, and section 5 shows the empirical results. The last section summarizes the empirical findings and serves as a conclusion.

2. The failure of Enron and the audit profession in France

The Enron Corporation was founded in 1985. The main activity of this corporation was the distribution of natural gas by pipeline in the United States (Helay and Palepu, 2003). Between 1987 and 1990 Enron was the leader in this field. On December 31, 2000, the market capitalization of Enron was about 60 billion dollars. Arthur Houston Office was the auditor of Enron. This audit firm was one of the two largest American financial services. The income of this auditor group was 9.3 billion dollars, 46% coming from the American market. Furthermore, this group had 81 offices in the United States and 85,000 employees throughout the world (Jan Barton 2005) and 28000 in United States.

At the end of 2001, when the failure of Enron was announced and Arthur Andersen L.L.P destroyed the large number of Enron documents and computer files. The Federal Energy Regulatory Commission began investigating if Enron and other energy trading had manipulated the California electricity market between 2000 and 2001. Three major reactions were noted. The first one concerns the reaction of the market. According to many researchers, Enron's failure and the role of Andersen affected financial markets and the confidence of investors. Chaney and Philipich (2002) investigated the effect of Enron's audit failure on the reputation of Arthur Andersen's clients through the negative effects on stock prices. They found that Andersen's clients suffered from a significant negative reaction during key disclosure concerning Enron and Andersen relation. Callen and Morel (2002) compared the daily stock returns of Andersen's clients on a control sample of other Big 5 auditors' clients between October 2001 and January 2002. They showed that in the month when the failure of Enron was announced, Andersen's brand name was negatively affected. Krishnamurthy, Zhou, and Zhou (2002) found that the market reacted more negatively than when the news about Andersen was announced. Moreover, they note that the market reacted more negatively to Andersen's clients than to other Big 4 auditors' clients. Cahan and Zhang (2006) studied the reaction of the share prices of Andersen's customers outside the United States (521 clients in 38 different countries). They found that the share prices of Andersen's clients reacted negatively between December 12, 2001 and February 4, 2002.

The second reaction concerns the Big 4 brand name: the Big 4 group lost their reputation after the Enron scandal. These advanced studies concerning the market reaction singled out the lack of trust in the Big 4's audit services. This situation can decrease the part of large audit firm in audit services. This due to the lack of investor trusting associated to big brand name after Enron collapse. The third reaction concerns the legal sector. In July 2002, the United States Congress adopted the Sarbanes-Oxley Act. This law established new control procedures and created a new organism called *Public Company Accounting Oversight Board* (PCAOB). The same act was adopted in France in 2003. This security act established a new organism called "*Haut Commissariat aux Comptes*" which guarantees the auditor's independence.



3. Audit quality and characteristics of institutional investors

Most of recent studies show that audit is an important mechanism of corporate governance. Jensen and Meckling (1976) demonstrated that audit reduces the likelihood of information asymmetries between investors and managers. Palmrose (1988) found that the audit report is a key factor in the reaction of the market. But this depends on the auditor's reputation. Theoretical and empirical backgrounds detected the differences in audit practices between large and small audit firms. For this reason, recent studies dealt with the concept of audit quality. DeAngelo (1981) defines audit quality as the probability that the auditor will both detect and report a breach in the contract to provide fair accounting information. Independence and competence are two main characteristics of audit quality. All the latest research on audit quality confirms that the Big 4 offer audit quality more than small audit firms. Becker *et al.* (1998) demonstrated that firms audited by the Big 4 benefit from better audit quality than those audited by the Non-Big 4 group. That was due to many reasons. For

example, the Big 4 have the human and financial resources. These two factors affect auditor's skills.

Prior archival audit studies focused on the demand for auditing (DeFond, 1992; Francis and Wilson, 1988; Watts and Zimmerman, 1986) demonstrate that the ownership structure influences the choice of auditors. In recent studies, Guedhami and Pittman (2006) find no evidence that auditor choice reduce ownership concentration in international analyses over 31 countries. Wang, *et al.* (2008) studied the choice of auditors in China. Empirical results showed that State Owned Enterprises and non State Owned Enterprises appoint small auditors. In the same context, Jun Lin and Liu (2009) treat the choice of auditor during a period of 2001- 2004. They found that chines firms with large controlling shareholders are less to hire Top 10 auditors. Ashbaugh and Warfield (2003) studied audit demand in Germany. They found a positive relationship between ownership dispersion and audit quality. Lenox (2005) investigated the relation between audit quality and management ownership in the United Kingdom. He found a negative correlation between shares held by managers and audit quality.

Various works examine the link between manager ownership and audit quality. But in practice, we distinguish the presence of institutional investors in the ownership structure. This group of shareholders is characterized by their ability to carry out financial analysis and their needs for information quality. Since the end of 1990, institutional investors have adopted active monitoring hypotheses in corporate organisations, and in many countries throughout the world (Gillan and Starks 2000). Otherwise, the presence of institutional investor became the important characteristic of financial market. For example, the public pension fund began to abandon their traditional monitoring role and became more active in corporate governance. This role increase when the conflict of interest is very significant between manager and shareholders. The institutional investors use their ownership to pressure manager to act in the best of the shareholders. Maug (1998) notes that the decision of institutional investor is partially a function of share held by this group of investor. McConnell and Servaes (1990) find that the ownership of institutional investor is positively associated to the firm performance measured by the Tobin's Q. Generally, major of last researches confirm this relation. Contrary to this conclusion, Chen et al. (2006) suggests that institutional investors (pension funds, insurance companies, mutual funds) provide little monitoring in China context. It is clear that the role of institutional investor varied throught every context.

According to the security Rule, the institutional investor are composed from banks, insurance companies, mutual funds and pension funds (Bushee, 1998).

The presence of institutional investors in the ownership structure influences the way in which activity is monitored in the corporation. As a whole, institutional investors try to control their investment. They are the most informed about the corporation's situation. To evaluate their portfolio choice, institutional investors needs credible accounting information. The annual report is the main source of credible information. Prior studies found that audit report and financial statements provided a clear signal on firm health and performance (Dye, 1993; Willenborg, 1999; O'Reilly, Leitch and Tuttle, 2006). This signal influences the market reaction and depends from auditor brand name and audit firm reputation. As has been demonstrated by previous research, Big 4 audit firms are considered as firms offering satisfying audit quality. For this reason, institutional investors hire the Big 4. Carcello et al. (2002) and Abott et al.(2003) suggest that audit quality presented by big audit firm mitigate agency cost and the likelihood of irregular and fraudulent financial statement.

We note that French corporations are family- owned or belong to individual shareholders (Lakhel 2006). According to the agency theory, information asymmetries will appear between shareholders in this case. Institutional investors choose the Big 4 to reduce agency problems. Furthermore, France suffers from a lack of investor protection (La Porta et al. 1998). It is for this reason that the perception of foreign institutional investor is not the same as that of the French institutional investor. Hay and Knechel (2004) argued that the audit demanding rose when stakeholders were placed in the security environment characterized by the lack of legal protection. This point of view increases the role of big audit firm in the civil law countries and some emerging market characterized by the immature of financial security system. For example, Ting et al. (2009) treated the influence of qualified foreign institutional investor (QFII) on the association between default risk and audit opinion in China. They found that QFII have a greater pressure on auditor to issue audit opinions with greater prudence. Several studies demonstrated that institutional investors are active monitor (Wall Street Journal, 1995, 1996, 1997). This monitor increase when the environment is characterized by the less legal protection. In this way, Kane and Velury (2004) find that the greater the level of institutional ownership, the more likely it is that a firm choose audit service from a large audit firm in order to ensure high audit quality. Institutional investors have a material resource and law skills to against auditor when this last certify irregular financial statement. They influence management accounting policy choice. Since the end of 2001, the role of Arthur Andersen

L.L.P in Enron's failure has been very clear. The Big 4 auditors lost their reputation after the Enron scandal. We test the following two hypotheses:

***H1:** After the Enron scandal, institutional investor ownership is negatively associated with the choice of the Big 4.*

***H2:** After the Enron scandal, the presence of the foreign institutional investor is negatively associated with the choice of the Big 4 in France.*

4. Method

4.1 Sample selection

The sample selected is composed of 144 French enterprises listed on SBF 250. Three criteria have been adopted for the selection sample in this study. First, every identified corporation must have all interest variables in Thomason Financial data bases over 2000-2007. Second, every corporation must have its annual reports available to identify the institutional investor's ownerships and their nationality. Third, banks, insurance companies and financial enterprises are excluded due to their accounting specificities and financial legislation. If we apply these conditions we find 144 French corporations examined over a period of six years, from 2000 to 2007 (1152 observations enterprise-year).

Table 1: Sample characteristic

Sector	Worldscope Code	N
Automotive	1900	6
Construction	2800	6
Chemicals , Drugs, Cosmetics and Health Care	3400-2500	8
Electrical	3720	8
Electronics	4000	18
Food	4600-2200	6
Metal, Oil and Gaz	5500-5800	9
Recreation	6700	7
Retailers	7000	8
Service Organisations	8580-8510	31
Wholesalers	8591	14
Textiles	7300	2
Transportation	7900	4
Others	3100	17
Total		144

Regression Model and Variables definition

Following prior research, our regression model is as follows:

$$\text{If } 0 < \text{Big 4} \leq 2; \quad \text{Big 4} = 1$$

$$\text{If } \text{Big 4} < 1, \quad \text{Big 4} = 0$$

Probit Regression

$$\text{Big 4} = \alpha_0 + \beta_1 \text{INST} + \beta_2 \text{NAT} + \beta_3 \text{LTD} + \beta_4 \text{ASTR} + \beta_5 \text{AGE} + \beta_6 \text{SIZE} + \beta_7 \text{SIZE}^2 + \beta_8 \text{GRW} + \beta_9 \text{T RISK} + \beta_{10} \text{O RISK} + \beta_{11} \text{MOM} + \beta_{12} \text{ROA} + \zeta$$

Dependent variable

Big 4: Dummy variable, which equal 1 if one of the two legal auditors is one of the Big 4 network, 0 otherwise;

Independent variable

INST: Major institutional ownership percentage;

NAT: Dummy variable, which equals 1 if the nationality of the institutional investor is not French, 0 otherwise;

Control variables

LTD: Long term debt to total assets;

ASTR: Gross, property, plant and equipment to total assets;

Age: Corporation age since the date of foundation

Size: Natural logarithm of total assets;

Size²: Size square;

GRW: (Total sales of next year divided by the total sales of current years) -1;

T Risk: Total risk (see Appendix 1);

O Risk: Operating risk (see Appendix 1);

MOM: Dummy variable, which equals 1 if the firm is listed on more than one market, 0 otherwise;

ROA: Return on assets;

ζ: Errors terms.

We only use one stage in this study. According to prior studies, our dependent variable (Big 4) is a dummy variable, 1 if one of the two legal auditors is one of Big 4, 0 otherwise. We note that French context is present his specificities compared to the others context. Listed companies must appoint two different auditors to assure the legal mission. To test our two hypotheses, we use the percentage of capital held by the institutional investor in the first hypotheses, and then we use the dummy variable, 1 if the institutional investor is foreign, 0 otherwise to test our second hypothesis

Control variables

Focusing on previous research we use variables related to firm characteristics in our model. Building on the study of Broy and Weill (2008), we use long term debt (LTD) to control the effect of credit organism on the choice of auditor. The latest empirical studies found a positive relation between large audit firm and long term debt in the United States context (Francis and

Willson 1988; Eichenscher and Shield 1989; DeFond 1992; Reed et al. 2000). In addition, in our model we use assets structure (ASTR) to control auditor expertise. Besides we use three measures of agency problem. We use size (Size, log of total assets), size square because Lenox (2005) found a non linear association between size and auditor choice, growth (GRW, Sales variation) and square roots of employers number. But we exclude the latest because we find a high positive correlation between this variable and size. This correlation can affect the regression result. Wang, Q and al. (2008) show that growth is not associated to non-Big 4 firms in China. In the same context, Wang, Q and al. (2008) found a significant relation between small auditors and firm size. Risk is another factor that can affect the choice of an auditor. We use two measures of risk. The first one concern operating risk (O RISK) and the second is total risk (T RISK) (Piot 2001). Palmarose (1988) showed that firms audited by the Big 4 had a lower risk of litigation. Furthermore, we use the age (AGE) of the corporation to control the effect of culture on auditor choice. Following Asbaught and Warfield (2003), we coded 1 when the firm is listed on more than one financial market (MOM), 0 otherwise. Finally, we use return on assets (ROA) as an additional indicator of firm risk.

5. Results

5.1 Descriptive statistics and Univariate analyses

Insert Table 2

Table (2) shows the descriptive statistics of the sample from 2000 to 2007. Companies audited by the Big 4 firms represent 73.33% of the sample. This result confirms that the French audit market is dominated by the Big 4 audit firms. Table (3) reports the distribution of the Big 4 audit market between 2000 and 2007. The distribution demonstrates that Ernest Young Audit Firm control 29.3% of the audit legal mission confides to Big 4 audit firm in our sample. Focusing in this distribution, we found Deloitte & Touche coming in the second rank with 26% and KPMG in the third rank with 25.3%. Finally, the small part of the legal audit mission is confided to Price Waterhouse Coopers with 19% from 2000 to 2007. Table (4) reports the distribution of Big 4 legal audit mission by activity sector. In metal, oil and gas sector, Deloitte & Touche, Ernest & Young and KPMG Corporation have the same market proportion from 2005 to 2007. Contrary to the other sector, Price Waterhouse Coopers detained the major percentage of Big 4 legal audit mission in the automotive sector with 43%

through the eight years. In the recreation sector, Ernest & Young control 40% and the three other leaders detained 60% with 20% for every audit firm in 2007.

Table 3: The distribution of the Big 4 audit market from 2000 to 2007

	2000	2001	2002	2003	2004	2005	2006	2007
Deloitte & Touche	0.24	0.24	0.24	0.26	0.29	0.27	0.27	0.27
Ernest & Young	0.29	0.28	0.30	0.32	0.28	0.29	0.29	0.30
KPMG	0.26	0.26	0.26	0.24	0.24	0.26	0.26	0.25
PWH	0.21	0.22	0.20	0.18	0.18	0.17	0.18	0.18

Insert Table 4

Focusing on the table (2) associated to the descriptive statistics; the institutional investor ownership detained approximately 26% of the total equity of our sample. We note that the French institutional investor is higher in the case of the enterprises audited by non-Big 4 audit firm than the corporations audited by the large audit firm. More than 50% of French listed companies have more than 20% of their equity controlled by institutional investor. The maximum of the institutional investor ownership exceed 95% in the case of *Provimi* and *Société de la Tour d'Eiffel* in 2000. Summarize descriptive statistics (table 5) before and after Enron scandal demonstrate the decrease of the French institutional investor ownership in the enterprises audited by Big 4 and the increase of this percentage in the enterprises audited by non-Big 4. *Univariate analysis* presented in the table (6) shows that there is no difference in the mean and in the median between French institutional ownership in the enterprises audited by the Big 4 and the non-Big 4 ($t\text{-test} = 0.282$) before Enron collapse. This situation is not the case after Enron scandal. *Univariate analysis* confirms the differences in the mean and in the median of the French institutional investor after Enron failure. This means that the perception of French institutional investor was changed to large audit firm. *T-student* and *Wilcoxon two sample tests* are positively significant at 5% after Enron scandal in the case of the French institutional investor ownership. This is due to Arthur Andersen L.L.P role in Enron scandal. We note also, that the mean of the French institutional investor increase in the case of the firms audited by non-Big 4 audit firms compared to Big 4 firms after Enron period. Otherwise, after the Enron scandal, we can see the decrease of French institutional investor ownership in the firms audited by the Big 4 compared to the post Enron failure.

Table 5: Summarize Descriptive statistics before and after Enron scandal

	Before Enron scandal				After Enron scandal			
	Big 4		Non-Big 4		Big 4		Non-Big 4	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Inst	0.256	0.238	0.263	0.151	0.247	0.181	0.294	0.249
Nat	0.256	0	0.177	0	0.289	0	0.198	0
Ltd	0.333	0.142	0.577	0.141	0.223	0.156	0.391	0.148
Astr	0.187	0.139	0.156	0.120	0.177	0.117	0.142	0.102
Size	13.89	13.58	13.79	13.32	14.36	14.09	13.60	13.37
Grw	0.212	0.121	0.211	0.145	0.111	0.600	0.115	0.069
T Risk	0.872	0.024	0.092	0.022	0.304	0.021	0.072	0.025
O Risk	0.322	0.222	0.301	0.201	0.299	0.136	0.269	0.138
MOM	0.286	0	0.128	0	0.346	0	0.143	0
Roa	0.000	0.027	0.041	0.034	0.054	0.036	0.157	0.036

Contrary to the French institutional investor, the percentage of the foreign institutional investor institutional investor in the case of the enterprises audited by large audit firm exceeds the percentage of the enterprises audited by non-Big 4 before and Enron collapse. This mean that foreign institutional investor perceive large audit firm that firms that have the ability to control international corporations. The size of corporation justifies this finding. The descriptive statistics demonstrate that the size of the corporate audited by large audit firm is more than the firm audited by non-Big 4. More than 50% of the corporations audited by Big 4 have their total assets exceed 1 million euro. This amount is equal to 622 thousand euro in the case of firms audited by non-Big 4. The same conclusion is for asset structure. The mean of gross, property and equipment for the firm audited by Big 4 is equal to 18% of the total assets and 14.9% for the firm controlled by the small audit firm through the sample between 2000 and 2007. Focusing on summarize descriptive statistics before and after Enron collapse, we note that the percentage of the foreign institutional investor increase after Enron failure. This percentage passed from 25.6% before Enron scandal to 28.9% in the firms audited by Big 4 after Enron failure. This remark demonstrates that the perception of foreign institutional investor in French context does not affected by Enron failure and Andersen role. *Univariate analysis* demonstrates this finding. The result shows that there is a difference in ownership of foreign institutional investor at the levels of 10% and 5% before and after Enron scandal. Contrary to the French major institutional investor, the foreign institutional investor continued to appreciate the audit quality of the Big 4 group in France. This result shows that the perception of foreign institutions to Big 4 services did not changed after Arthur Andersen's failure. This result demonstrate that foreign institutional investor see the Big 4 as the suppliers

of audit quality much than small audit firms. This perception is as a function of the audit role in every country. For example the role of audit in Anglo-Saxon countries is considered as a mechanism of insurance (*deep-pocket theory*). We note, that foreign institutional investor in our sample coming generally from Anglo-Saxon countries. US investor and Canadian investor are coming in the first rank in French context between 2000 and 2007 in our sample.

The mean of the leverage ratio is equal to 14.8 % of the sample (table 1). The leverage ratio before and after Enron collapse of the enterprises audited by the non-Big 4 is more than the firms audited by Big 4. We document that the leverage level of the enterprises audited by the two leaders decrease. We note also, that more than the half of the enterprises audited by Big 4 has their age more than 33 years old. The mean of the growth sales of the firms audited by small audit firms is equal to 16%. 50 % of the corporations audited by large audit firm have the percentage less of the 74.30%. 26.9% of the firms of our sample are listed on more one market. For the firms audited by Big 4, this percentage is equal to 32.6% and only 13.6 % for the firms audited by non-Big 4. The mean of the return on assets of the all sample is equal to 5.6%. For the total risk, we note that is approximately the same for corporation audited by the two leaders of audit.

Insert Table 6

5.2 Regression Results

Insert Table 7

Insert Table 8

The limit of our univariate analysis is that it ignores a number of control variables that can affect our result, for this reason we performed multivariate analyses. Table 5 reports results from a probit regression in which the dependent variable equals one if one of the two auditors is one of the Big 4 audit firms, 0 otherwise, and table 6 reports the marginal effect. We use the Probit method because French laws oblige listed enterprises to choose two auditors. R squared is equal to 7.7% for the first model (*before Enron scandal*) and 9% after the Enron scandal model. The two models are significant at 1%. The first result concerns the relation between major ownership of institutional investor and the choice of auditors before and after

the Enron scandal. We note that the link between the choice of the Big 4 and institutional investors is negative and statistically significant after the Enron scandal at 5% ($p=0.029$). This empirical result shows that the perception of the Big 4 by institutional investors changed after the Enron scandal. This result means that the trust and the confidence of French institutional investors decreased after the Enron scandal and Arthur Andersen's failure in 2002. The marginal effects before the Enron scandal demonstrate that the increase of 1% in institutional investors increases the probability to choose one of Big 4 by 1.08%. This confirms that, before the Enron scandal, institutional investors researched financial statements certified by the Big 4 audit firms. This result is not the same after the Enron scandal. After the despaired of Arthur Andersen's L.L.P on the audit firm, the increase of 1% in major French institutional investors decreased the probability to choose one of the Big 4 by 17.59%. This provides support for our first hypothesis.

Our second hypothesis deals with the foreign institutional investor. Empirical results show that there is a positive and statistically insignificant link between foreign institutional investors and the Big 4 appointment before ($t = 0.365$) and after the Enron collapse ($t=0.804$). These findings demonstrate that the perception of the foreign institutional investor was not affected by the Enron scandal and Arthur Andersen's role in this scandal at the end of 2002 in France. In conclusion, our second hypothesis associated to the relation between the foreign institutional investor and the appointment of large audit firms is not supported in the context that characterized by the lack of investor protection compared to common Low Countries according to La Porta et al. (1999). This means that the perception of the institutional investor is a function of the audit role in every context. For example in the United States and Canada, audit is conceived as the insurance mechanism in the *deep-pocket theory* (Piot, 2005).

Some control variables are significant associated to the choice of the Big 4 after the Enron scandal in France. On the first hand, long term is negatively and significantly associated to the choice of the Big 4 at 10% after Enron collapse. This empirical result shows the perception banks have of the annual reports certified by the Big 4 audit firms in France. This provides evidence demonstrate that the Big 4 lost the confidence of banks after the Enron scandal. Otherwise, banking agencies are coming more prudent in the use of the certified annual reports. This result is different from the result obtained by Ashbaught and Warfield in Germany. Piot (2001, 2005) found that long term debt is insignificantly negatively correlated to the choice of the Big 4 in France in the case of firm's Investment Opportunity Set (IOS). In

the same way, Fan and Wong (2005) found that long term is insignificantly negatively associated to the choice of the Big 4 only in South Korea and Singapore.

The age of the company is negatively and significantly associated to the Big 4 at 5% only before the Enron scandal. This means that young French corporations chose the Big 4 before 2002 to demonstrate their financial statement credibility and signal their private information on the financial market. When the age of the firm increase with one year, the probability to choice one of the large audit companies reduce by 0.12%. After Enron collapse, the age variable is insignificant associated to the Big 4 choice.

Asset structure is another variable that affects the choice of an auditor in France before and after Enron's failure at 5%. This empirical result demonstrates that a high level of gross property and equipment increases the probability of hiring one auditor of the Big 4. But after the Arthur Andersen's L.L.P in Enron Collapse, the marginal effect decreased by 3% the choice of one of the Big 4 (36.66% before Enron and 33.02% after Enron). Contrary to asset structure, size is positively and significant related to the choice of the Big 4 at 5% only after the Enron scandal. This empirical finding shows that the French corporations that have agency problem in their organisation tend to choose a big audit firm after 2002. Previous research shows that the Big 4 reduce agency problem and asymmetries information in firms. Even more, operating risk is positively and significantly correlated to the choice of the Big 4. This empirical result means that, in France, the corporations which have operating risks hire the Big 4 before after Enron's failure. Moreover, the firms listed on more than one financial market are positively and significantly associated to the choice of the Big 4 before and after Arthur Andersen's scandal. This means that if the firm is listed on more than one financial market, the probability of hiring one of the Big 4 decreased with 18%. The marginal effect of firms listed on more than one market decreased by 5% after the Enron scandal. Total risk is negatively and insignificant associated to the choice of the Big 4 before and before and after the Enron scandal, this result is consistent with previous research. Palmrose (1988) showed that the firms audited by the Big 4 had a lower risk of litigation. Return on assets is negatively and insignificantly related to the choice of the Big 4, which is the same result as the result obtained by Broy and Weill (2008). This result suggests that firms appointing the Big 4 are relatively riskier than firms audited by the Non-Big 4.

6. Conclusion

Through the world, large audit firms or Big 4 are considered the suppliers of audit quality. Most of previous research confirms this result. Becker *et al.* (1998) found that the firms audited by the Big 4 had lower discretionary accruals in the United States than the firms audited by the Non-Big 4. Palmrose (1988) reported that the audits by the Big 4 (*ex-Big 8*) were less likely to result in litigation. To sum up, according to the latest research, audit quality is related to the Big 4 brand name.

At the end of 2001, when Enron's failure was announced, the role of Arthur Andersen L.L.P, one of the largest financial services through the world, in this scandal was very significant. Three reactions were noted after this scandal. The first one concerns the reaction of the market. Most financial markets reacted negatively after the Enron collapse. The second reaction was associated to the auditor's brand name. It means that the Big 4 audit firms lost their reputation after Arthur Andersen's L.L.P role in Enron scandal after 2002. Third, the reaction concerns legislative environment. After this failure, many countries adopted the Financial Security Acts. For example, United States adopted the Sarbanes-Oxley Act to reinforce corporate governance after 2002. France created the "*Loi de la sécurité financière*" in 2003 and established the "*Haut Commissariat aux Comptes*" to guarantee the independence of auditors. The purpose of this paper is to study the relation between the choice of an auditor and the characteristics of institutional investors after the Enron scandal in French context that characterized by their specificities in audit domain.

Empirical findings show that the perception of the French institutional investor is negatively and significantly associated to the choice of the Big 4 at 5%. This means that the brand name of Big 4 was discredited after the Enron scandal in France. Contrary to French institutional investors, the link between the foreign institutional investor remained positive and insignificant in a country that was qualified as the country that has a lack of investor protection (La Porta et al. 1998). The dummy variable associated to the listed companies on more one market confirms that foreign institutional investor have the different perception to large audit firms compared to the French institutional investor. This result confirms that an audit services varies from every context. In the same context, empirical results show that even after the Enron scandal, the Big 4 continue to reduce agency problem in French corporations. However, firm with high tangible assets still appointed the Big 4 after the Arthur Andersen's role in Enron scandal 2002. We note today that firms invest a high level of their investment in

intangible assets. This finding is justified in Resource Based View theory and can affect the choice of an auditor.

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Table 2: Descriptive statistics

(144 enterprises)

	All sample					Big 4					Non-Big 4				
	Mean	sd	Min	Median	Max	Mean	sd	Min	Median	Max	Mean	sd	Min	Median	Max
Big 4	0,733	0,442	0.000	1.000	1.000	1.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000
INST	0.259	0.226	0.000	0.200	0.990	0.247	0.217	0.000	0.181	0.883	0.289	0.238	0.000	0.236	0.935
NAT	0.251	0.434	0.000	0.000	1.000	0.281	0.450	0.000	0.000	1.000	0.191	0.394	0.000	1.000	0.000
LTD	0,325	1,782	0.000	0,148	44.109	0,259	1,611	0.000	0,149	44,109	0,479	1,946	0.000	0.147	22.255
ASTR	0.173	0.161	0.000	0.0001	0,977	0,180	0.166	0.0001	0,123	0,977	0,149	0,144	0,001	0,002	0,942
AGE	50.284	54.204	0.000	32	342	49.360	52.188	0.000	33	342	52.456	58.689	0.000	31	337
SIZE	14,047	2,116	8,634	13,677	18,660	14,209	2,118	8,755	13,863	18,660	13,665	2.064	8.634	13.341	18.186
GRW	0,149	0,336	-0,743	0,077	3,920	0,145	0,344	-0,743	0,743	3,920	0,160	0,318	-0,614	0.090	3.630
T RISK	0.300	0.403	0.001	0.164	2.959	0.306	0.413	0.001	0.169	2.959	0.284	0.380	0.001	0.160	2.002
ORISK	0.370	2.302	0.000	0.022	34.665	0.493	2.735	0.000	0.022	34.665	0.081	0.261	0.000	0.024	2.352
MOM	0,269	0.444	0.000	0.000	1.000	0,326	0,469	0.000	0.000	1.000	0,136	0.343	0.000	0.000	1
ROA	0.056	0,442	-5,702	0,035	7,323	0,326	0,301	-5,701	0,033	3.238	0,102	0.663	-4.572	0.037	7.323

Big 4: Dummy variable, which equals 1 if the auditor is one of the Big Four, 0 otherwise; **INST**: Major institutional ownership percentage; **NAT**: Dummy variable, which equals 1 if the nationality of institutional is foreign, 0 otherwise; **LRD**: Long term debt to total assets; **ASTR**: Gross Property Plant and Equipment to total assets; **AGE**: Corporation age since the foundation date; **SIZE**: Natural logarithm of total assets; **SIZE²**: Square of size; **GRW**: (Total sales of next year divided by total sales of current year) -1; **T RISK**: Total risk (see Appendix 1); **O RISK**: Operating Risk (see Appendix 1); **MOM**: Dummy variable, which equals 1 if the firm is listed on more than one market, 0 otherwise; **ROA**: Return on Assets.

Table 4: Distribution of legal audit mission in the data

Sector Activity	Auditeurs	2000	2001	2002	2003	2004	2005	2006	2007
Automotive	Deloitte & Touche	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14
	Ernest & Young	0,29	0,29	0,29	0,29	0,29	0,29	0,29	0,29
	KPMG	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14
	PWH	0,43	0,43	0,43	0,43	0,43	0,43	0,43	0,43
Construction	Deloitte & Touche	0,50	0,50	0,50	0,57	0,57	0,50	0,50	0,50
	Ernest & Young	0,33	0,17	0,17	0,14	0,14	0,13	0,13	0,11
	KPMG	0,17	0,17	0,17	0,14	0,14	0,25	0,25	0,33
	PWH	0,00	0,17	0,17	0,14	0,14	0,13	0,13	0,11
Chemicals	Deloitte & Touche	0,00	0,00	0,13	0,13	0,18	0,18	0,25	0,25
	Ernest & Young	0,29	0,29	0,25	0,25	0,27	0,27	0,25	0,25
	KPMG	0,43	0,43	0,38	0,38	0,27	0,27	0,25	0,25
	PWH	0,29	0,29	0,25	0,25	0,27	0,27	0,25	0,25
Electronics	Deloitte & Touche	0,31	0,31	0,29	0,25	0,24	0,18	0,18	0,18
	Ernest & Young	0,31	0,31	0,29	0,38	0,35	0,35	0,35	0,35
	KPMG	0,23	0,23	0,29	0,25	0,29	0,29	0,29	0,24
	PWH	0,15	0,15	0,14	0,13	0,12	0,18	0,18	0,24
Electrical	Deloitte & Touche	0,43	0,43	0,38	0,33	0,30	0,30	0,27	0,27
	Ernest & Young	0,14	0,14	0,25	0,33	0,30	0,40	0,36	0,36
	KPMG	0,14	0,14	0,13	0,11	0,20	0,20	0,27	0,27
	PWH	0,29	0,29	0,25	0,22	0,20	0,10	0,09	0,09
Food	Deloitte & Touche	0,00	0,00	0,00	0,17	0,17	0,17	0,17	0,17
	Ernest & Young	0,00	0,00	0,20	0,17	0,17	0,17	0,17	0,17
	KPMG	0,50	0,50	0,40	0,33	0,33	0,33	0,33	0,33
	PWH	0,50	0,50	0,40	0,33	0,33	0,33	0,33	0,33
Metal Oil Gaz	Deloitte & Touche	0,17	0,17	0,17	0,29	0,33	0,30	0,27	0,27
	Ernest & Young	0,50	0,50	0,50	0,43	0,33	0,30	0,27	0,27
	KPMG	0,33	0,33	0,33	0,29	0,22	0,30	0,27	0,27
	PWH	0,00	0,00	0,00	0,00	0,11	0,10	0,18	0,18
Recreation	Deloitte & Touche	0,00	0,00	0,00	0,00	0,20	0,20	0,20	0,20
	Ernest & Young	0,60	0,60	0,60	0,57	0,40	0,40	0,40	0,40
	KPMG	0,20	0,20	0,20	0,29	0,20	0,20	0,20	0,20
	PWH	0,20	0,20	0,20	0,14	0,20	0,20	0,20	0,20
(Relailers)Distribution	Deloitte & Touche	0,20	0,22	0,22	0,22	0,33	0,33	0,33	0,33
	Ernest & Young	0,10	0,11	0,22	0,22	0,11	0,11	0,11	0,11
	KPMG	0,60	0,56	0,44	0,44	0,44	0,44	0,44	0,44
	PWH	0,10	0,11	0,11	0,11	0,11	0,11	0,11	0,11
Services	Deloitte & Touche	0,17	0,16	0,16	0,19	0,31	0,33	0,33	0,32
	Ernest & Young	0,44	0,42	0,42	0,43	0,35	0,33	0,30	0,32
	KPMG	0,11	0,16	0,21	0,19	0,19	0,19	0,20	0,19
	PWH	0,28	0,26	0,21	0,19	0,15	0,15	0,17	0,16
Wolesalers	Deloitte & Touche	0,17	0,17	0,17	0,14	0,14	0,09	0,09	0,09
	Ernest & Young	0,00	0,00	0,00	0,14	0,14	0,27	0,27	0,36
	KPMG	0,67	0,67	0,67	0,57	0,57	0,55	0,55	0,45
	PWH	0,17	0,17	0,17	0,14	0,14	0,09	0,09	0,09
Textil	Deloitte & Touche	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	Ernest & Young	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50
	KPMG	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	PWH	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50
Transport	Deloitte & Touche	1,00	1,00	1,00	0,67	0,67	0,67	0,67	0,67
	Ernest & Young	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	KPMG	0,00	0,00	0,00	0,33	0,33	0,33	0,33	0,33
	PWH	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Others	Deloitte & Touche	0,38	0,38	0,38	0,42	0,38	0,33	0,31	0,31
	Ernest & Young	0,50	0,50	0,50	0,42	0,38	0,42	0,46	0,46
	KPMG	0,00	0,00	0,00	0,00	0,08	0,08	0,08	0,08
	PWH	0,13	0,13	0,13	0,17	0,15	0,17	0,15	0,15

Table 6: Univariate Analyses

Before Enron (2000-2002)

After Enron (2003-2007)

	Before Enron (2000-2002)						After Enron (2003-2007)					
	<i>Big 4 (A)</i>		<i>Non-Big 4 (B)</i>		<i>Diff. Test (B-A)</i>		<i>Big 4 (A)</i>		<i>Non-Big 4 (B)</i>		<i>Diff. Test (B-A)</i>	
	Mean	Median	Mean	Median	<i>t-stat</i>	<i>z-stat</i>	Mean	Median	Mean	Median	<i>t-stat</i>	<i>z-stat</i>
Institutional Ownership	0.256	0.238	0.263	0.151	0.282	-0.029	0.247	0.181	0.294	0.249	2.427**	2.032**
Institutional Investor Nationality	0.256	0.000	0.177	0.000	-1.894*	-1.888*	0.289	0.000	0.198	0.000	-2.389**	-2.381**

***, ** and *denote significance at $p < 0.001$, 0.05 and 0.1 respectively.

Institutional Ownership: Major institutional ownership percentage.

Institutional Investor Nationality: Dummy variable, which equals 1 if the nationality of institutional is foreign, 0 otherwise.

t-stat: Test of the differences of the mean between two independent samples;

z-stat: Wilcoxon two-sample tests

TABLE 7: Estimations Results Post and After Enron Scandal

Method: Probit Regression

Dependent variable: Big 4

$$\text{Big 4} = \alpha_0 + \beta_1 \text{INST} + \beta_2 \text{NAT} + \beta_3 \text{LTD} + \beta_4 \text{ASTR} + \beta_5 \text{AGE} + \beta_6 \text{SIZE} \\ + \beta_7 \text{Size}^2 + \beta_8 \text{GRW} + \beta_9 \text{T RISK} + \beta_{10} \text{O RISK} + \beta_{11} \text{MOM} \\ + \beta_{12} \text{ROA} + \zeta$$

Estimates results

Post Enron (2000-2002)

After Enron (2003-2007)

Variable Name	Parameter			Parameter		
	Estimate	t-statistics	p-value	Estimate	t-statistics	p-value
Intercept	0.4443	0.90	0.371	-5.5825	-2.19	0.029
INST	0.3129	0.11	0.912	-0.6324	-2.69	0.007
NAT	0.1474	0.91	0.365	0.0325	0.25	0.804
LTD	-0.0286	-1.24	0.213	-0.1953	-1.77	0.077
ASTR	1.0544	2.25	0.025	1.1872	2.88	0.004
AGE	-0.0036	-2.66	0.008	-0.0011	-0.98	0.328
Size	-0.0192	-0.60	0.549	0.8172	2.28	0.023
Size ²	-0.0001	-1.05	0.294	-0.0265	-2.11	0.035
GRW	0.0069	0.04	0.972	0.1717	0.89	0.373
T RISK	-0.2333	-1.11	0.267	-0.0733	-0.45	0.649
O RISK	0.4852	2.66	0.008	0.8503	2.68	0.007
MOM	0.5992	3.37	0.001	0.5511	3.91	0.000
ROA	-0.0255	-0.19	0.849	-0.2397	-0.95	0.341
Number of observation	432			720		
Rsquared	7.70%			9.00%		
LR (12)	44.11			73.08		
Prob	0.000			0.000		

TABLE 8: Marginal Effect Post and After Enron Scandal

Dependent variable: Big 4

$$\begin{aligned} \text{Big 4} = & \alpha_0 + \beta_1 \text{INST} + \beta_2 \text{NAT} + \beta_3 \text{LTD} + \beta_4 \text{ASTR} + \beta_5 \text{AGE} + \beta_6 \text{SIZE} \\ & + \beta_7 \text{Size}^2 + \beta_8 \text{GRW} + \beta_9 \text{T RISK} + \beta_{10} \text{O RISK} + \beta_{11} \text{MOM} \\ & + \beta_{12} \text{ROA} + \zeta \end{aligned}$$

Marginal effect results

Post Enron (2000-2002)

After Enron (2003-2007)

Variable Name	Parameter			Parameter		
	Estimate	t-statistics	p-value	Estimate	t-statistics	p-value
INST	0.0108	0.11	0.912	-0.1759	-2.69	0.007
NAT	0.0500	0.91	0.365	0.0089	0.25	0.804
LTD	-0.0993	-1.24	0.213	-0.0543	-1.77	0.077
ASTR	0.3661	2.25	0.025	0.3302	2.88	0.004
AGE	-0.0012	-2.66	0.008	-0.0003	-0.98	0.328
Size	-0.0066	-0.60	0.549	0.2273	2.28	0.023
Size ²	-0.0000	-1.05	0.294	-0.0073	-2.11	0.035
GRW	0.0024	0.04	0.972	0.0477	0.89	0.373
T RISK	-0.0810	-1.11	0.267	-0.0203	-0.45	0.649
O RISK	0.1684	2.66	0.008	0.2365	2.68	0.007
MOM	0.1868	3.37	0.001	0.1383	3.91	0.000
ROA	-0.0088	-0.19	0.849	-0.0666	-0.95	0.341
Number of observation	432			720		
Rsquared	7.70%			9.00%		
LR (12)	44.18			73.08		
Prob	0.000			0.000		
Obser. prob	0.6226			0.7486		
Predict.prob	0.7008			0.8021		

Big 4: Dummy variable, which equals 1 if the auditor is one of the Big Four, 0 otherwise; **INST:** Major institutional ownership percentage; **NAT:** Dummy variable, which equals 1 if the nationality of the institutional investor is foreign, 0 otherwise; **LTD:** Long term debt to total assets; **ASTR:** Gross Property Plant and Equipment to total assets; **AGE:** Corporation age since the foundation date; **SIZE:** Natural logarithm of total assets; **SIZE²:** Square of size; **GRW:** (Total sales of next year divided by total sales of current year) -1; **T RISK:** Total risk (see Appendix 1); **O RISK:** Operating Risk (see Appendix 1); **MOM:** Dummy variable, which equals 1 if the firm is listed on more than one market, 0 otherwise; **ROA:** Return on Assets.

APPENDIX A: RISK COMPUTATION USING WORLDSCOPE DATABASE

Operating Risk

$$\text{O RISK} = \sigma \left\{ \frac{\Delta \text{ operating income [1.250]}_t}{\text{Total assets [2.9991]}_{t-1}} \right\} \text{ for } t = -4 \text{ to } 0.$$

Total Risk

$$\text{T RISK} = \sigma \left\{ \frac{\begin{aligned} &(\text{Common share outstanding [5.001]} * \text{Price closing [5.301]})_t \\ &+ \text{interest expense on debt [1.251]}_t + \text{cash dividend paid [4.551]}_t \end{aligned}}{\begin{aligned} &[\text{Total Assets [2.999]} - \text{Common Equity [3.501]} + \text{Closing Price [5.301]} * \\ &\text{Common share outstanding [5.001]}]_{t-1} \end{aligned}} \right\}$$

t = -4 to 0.

Note: [Worldscope items between brackets]

APPENDIX B: CORRELATION MATRIX BETWEEN EXPLONATORY VARIABLES

	Big 4	INST	NAT	LTB	ASTR	AGE	SIZE	GRW	O RISK	T RISK	MOM	ROA
Big 4	1.000											
INST	-0.058	1.000										
NAT	0.094	-0.027	1.000									
LTB	-0.058	-0.059	-0.047	1.000								
ASTR	0.089	0.069	0.128	0.102	1.000							
AGE	-0.026	0.039	-0.070	0.078	0.245	1.000						
SIZE	0.117	0.057	0.090	-0.075	0.253	0.356	1.000					
GRW	-0.021	-0.077	0.004	0.027	-0.104	-0.135	-0.166	1.000				
T RISK	0.025	-0.069	0.090	0.039	0.064	-0.043	-0.177	0.057	1.000			
O RISK	0.081	-0.025	-0.030	0.013	0.016	0.146	0.049	0.019	0.314	1.000		
MOM	0.196	-0.078	0.242	-0.007	0.133	-0.029	0.305	-0.076	0.049	0.035	1.000	
ROA	-0.068	0.013	-0.074	0.302	0.156	0.100	-0.039	-0.059	-0.097	-0.048	-0.051	1.000

Big 4: Dummy variable, which equals 1 if the auditor is one of the Big Four, 0 otherwise; **INST:** Major institutional ownership percentage; **NAT:** Dummy variable, which equals 1 if the nationality of the institutional investor is foreign, 0 otherwise; **LRD:** Long term debt to total assets; **ASTR:** Gross Property Plant and Equipment to total assets; **AGE:** Corporation age since the foundation date; **SIZE:** Natural logarithm of total assets; **SIZE²:** Square of size; **GRW:** (Total sales of next year divided by total sales of current year) -1; **T RISK:** Total risk (see Appendix 1); **O RISK:** Operating Risk (see Appendix 1); **MOM:** Dummy variable, which equals 1 if the firm is listed on more than one market, 0 otherwise; **ROA:** Return on Assets.