

# Determinants of Audit Fees: a Study in the Companies Listed on the BM&FBOVESPA, Brazil\*

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## ABSTRACT

This paper analyzes the determinants of audit fees paid by companies listed on the BM&FBOVESPA. Data referring to listed companies for 2012 show a positive relationship between fees and the variables size, client's complexity, and Big N auditors. The risk perceived by the auditor demonstrated to affect the values of fees differently in larger and smaller clients. In smaller clients, the results suggest that the auditor charges lower fees to more leveraged and riskier clients, contrary to the hypothesis that the auditor might charge higher fees as a reward for his risk. In turn, in larger clients, the results demonstrate that clients with higher risk, as measured by liquidity and leverage, or those having stronger governance practices, tend to spend more on auditing. As for changing the auditor, the results pointed out that larger clients pay less in the first year of audit. These results qualify the findings of Hallak and Silva (2012), suggesting the need for further research with temporally more extensive bases.

**Keywords:** audit expenses, audit fees, Big N.

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## 1 INTRODUCTION

Supervision of performance and assurance of accountability in management are key in corporate governance, and external audit constitutes a significant tool for maintaining good governance levels. In the 1980s and 1990s, large external audit firms (hereinafter firms) have gone through mega-mergers that reduced their number from eight – Big 8 – to five – Big 5 (Abidin, Beattie, & Goodacre, 2008). Added with accounting scandals in the 2000s – which led to Arthur Andersen's termination –, the last decades have seen the consolidation of this sector around the current Big 4 (hereinafter Big N).

This concentration accentuates the value assigned to the accounting information quality. The case Enron reveals that the reputation of firms has close ties with the independent audit conducted by them. Audit has value to the extent that investors and the market believe that the auditor is independent and, as a consequence, he will report significant distortions determined in the audited company, thus reducing expenses due to opportunistic behavior of managers (agency costs) (Watts & Zimmerman, 1983). The concentration of the auditing industry undermines competitiveness and reduces the options available to audited companies; such concentration, along with accounting scandals and the importance of auditing for corporate governance shed light on professional independence issues and the determination of external auditors' fees.

Studies on the determination of audit fees have been conducted since 1980 (Simunic, 1980), with an empha-

sis on English-speaking countries. Some of these studies point out convergence in the sense that clients' size and complexity are the main determinants of fees charged (Köhler & Ratzinger-Sakel, 2012; Haskins & Williams, 1988; Hassan & Naser, 2013; Kwon, Lim, & Simnett, 2014). Others indicate that the market pays higher values for large companies in the industry (Palmrose, 1986; Thinggaard & Kiertzner, 2008), perhaps because of firms' good reputation and market concentration.

Such research field is still embryonic in Brazil and little has been studied about the determinants of fees charged by the firms existing here. There is mandatory disclosure of fees in Brazil since 2009, when data used in the only research so far carried out in the country on the subject first became available (Hallak & Silva, 2012). Thus, it seeks to answer this question: which are the determinants of audit fees paid by Brazilian companies?

The contribution and academic relevance of this work derive from its analysis of the determinants of audit fees in the Brazilian context, addressing data from a new reference date (2012) and adding new variables, something which enables better understanding of the phenomenon of interest. It also contributes to market operation – with regard to grasping how fees are calculated – when providing information for negotiations between firms and their clients. The results obtained may encourage audited companies to seek new options of auditors, increasing competitiveness in the sector, as well as the development of new firms.

## 2 LITERATURE REVIEW

### 2.1 Audit Fees

The value of an audit lies on the perception coming from users of audited statements on the auditor's ability to detect errors or breaches in the accounting system and to resist client pressures to disclose such discoveries (DeAngelo, 1981a). Auditing will have value to the extent that users of financial statements believe that the auditor is capable and he will not omit or deliberately choose which findings should be reported.

The calculation of fees is a sensitive issue, where professional ethics and the interest of auditing did not allow that the prices budgeted are too high or too low. Marra and Franco (2001) suggest that the best way – for clients – to charge fees might be using a fixed and invariable value. Nevertheless, this procedure might lead to very high fees, damaging the client, or very low, damaging the auditor, having in mind that prices are budgeted by taking into account the number of hours or days required to conduct the audit. The intuitive pricing of expenses is calculated through a simple equation between estimated

number of hours (cost) and hourly rate to be applied, which may be expressed by this equation:

$$\text{AudE} = \text{HR} \times \text{RT}$$

Where:

AudE: Audit expenses

HR: Estimated number of hours

RT: Hourly rate to be charged

This calculation method enables the auditor to negotiate charging additional hours when the amount of hours significantly differs from that budgeted.

The Brazilian Accounting Standard (NBC) P1, approved by the CFC Resolution 976/2003, establishes general aspects and criteria that the auditor should consider when budgeting fees. The factors described in this document are intended to guide and set general criteria to determine fees. The analysis reveals the correlation between certain factors, such as in the case of service costs, the estimated hours, and the difficulty to establish metrics or proxies that allow addressing other factors, such as technical qualification of the auditors who will provide the services. Aspects related to the working risk

and corporate governance levels are not explicitly included in the text of this standard, but they affect the cost of services to be provided, as well as the number of hours estimated for their execution.

Due to the conjuncture describe above and, in order to align the factors described by the NBC P1 to previous studies, the factors affecting the determination of fees were, in this study, divided into two groups, namely: global and specific. Global factors cover the “Cost of Services and Estimated Hours,” reaching many of the determinants listed in the NBC P1, and also the factor “Market Opportunities,” which encompasses aspects not related to the cost and time span of services, but it addresses market and client-related opportunities and issues; in turn, specific factors are introduced throughout the paper.

A significant factor to assess client risk and to calibrate the extent of audit testing consists in assessing the internal control environment. The CFC Resolution 1,212/2009 recommends that, in addition to assessing the internal control structure, in order to identify the relevant risks, an auditor must measure, among others, the risk factors inherent to client’s sector and its funding form (Conselho Federal de Contabilidade, 2009). Simunic (1980) and Palmrose (1986, 1989) indicate that client’s sector significantly affects fees.

By determining the extent of sampling and testing, the auditor assesses the risk of auditing financial accounts and relevant procedures; such an assessment usually occurs after hiring and, in case of a failure in the estimation of fees, the auditor may have to undergo losses, because in spite of the possibility to negotiated additional fees, charging them is not guaranteed.

It is worth observing that an overall assessment of client risk occurs even before the audit is hired – i.e. still within the client acceptance process –, so that the auditor can estimate more accurately the number of hours required and the fees. This assessment will influence the amount of hours estimated to execute the service and the fee to be charged, as well as the decision whether to accept the client.

If a firm accepts a successful client, honest, with competent management and appropriate internal controls, the use of normal auditing procedures will enable the auditor to issue his opinion in the right way, and the reverse is true (Huss & Jacobs, 1991).

Such a general evaluation is also significant for planning, but it does not comprise a detailed analysis of relevant procedures and financial accounts; as it occurs even before hiring, the information addressed by the auditor are rather related to business risks, client’s industry issues, governance profile, and funding structure, than to internal procedures, control risks, and features of book accounts.

Upon the fees budget, the assessment of procedures and financial accounts takes place in a superficial way, because the audit is still in the valuation phase, and that the auditor should estimate his fees before even knowing

and having appropriate access to the procedures and book accounts involved. It is also worth stressing that, if this survey occurred, this might result in an expense either to the auditor or the company, prior to the effective hiring of services.

Marra and Franco (2001) notice that the likelihood of errors in the estimation of audit fees would be lower if the auditor could conduct this survey prior to budget the auditing cost. However, the client might need to be willing to pay the cost of surveys, regardless of whether hiring the services.

## 2.2 Previous studies

A part of the academic studies addressing the relationship of risks and corporate governance does not converge completely. The literature suggests an inverse relationship between cost of fees and internal control. In addition, reported internal control deficiencies tend to positively affect the cost of fees.

Hogan and Wilkins (2008) investigated how auditors respond to higher internal control risk levels. To do this, they analyzed 410 companies listed on the U.S. Stock Exchange that had reported material weaknesses in internal control. Thus, the authors found that audit fees are significantly higher for companies that showed significant weaknesses in internal control.

Munsif, Raghunandan, Rama and Singhvi (2011) corroborate this view by analyzing the behavior of audit fees in companies that have remedied deficiencies in internal control. Studies have shown that the fees paid tended to decline when compared to other companies that continued reporting internal control deficiencies.

Felix Jr., Gramlinga and Maletta (2001) found that internal audit contributes to reduce fees. This fact reinforces the premise that the quality of internal control structures helps to reduce auditing costs, showing that the internal audit quality affects a company’s internal controls.

In December 2000, the BM&FBOVESPA created the corporate governance levels in Brazil, whose purpose, among others, was distinguishing the internal control levels of listed companies.

Firms that adhere to corporate governance levels are more profitable and safer for investors (Macedo & Siqueira, 2006). So, they are expected to have higher requirement levels in board of directors’ organization and structure, enabling the use of various levels created by the BM&FBOVESPA as a proxy to indicate companies with better internal controls and observe whether they contribute to reduce fees.

Studies on corporate governance practices and, specifically, about auditing costs are not convergent. Bedard and Johnstone (2004) point out that better practices may reduce fees; in a similar vein, Chung and Wynn (2014) observed that, in listed Canadian companies, the auditor charges higher fees to clients who have greater governance risks. Conversely, Goodwin-

Stewart and Kent (2006) showed that companies with greater governance structures pay higher fees.

Yatim, Kent and Clarkson (2006) provided the governance instruments with greater detail and they observed a positive relationship between fees and independence of the board and the audit committee, as well as the frequency of meetings of the audit commission. According to the authors, this fact, from the temporal perspective, may require greater interaction of these agents with external auditors, requiring a greater number of meetings.

Griffin, Lont and Sun (2008) studied the controversial relationship between corporate governance and audit fees. The results of this study suggest that better corporate governance has reduced these costs after the U.S. Sarbanes Oxley Act. Better governance levels require more audit services; however, the auditor seems to notice an improved quality of financial statements and internal controls, a factor which decreases fees.

In studies conducted in Brazil, the results are also mixed. Bortolon, Sarlo and Santos (2013) observed a negative relationship between corporate governance and auditing costs, suggesting that better governance practices have reduced the external audit risks, leading to lower charges. Hallak and Silva (2012) found that companies with better corporate governance levels spend more on audit.

However, internal controls generate impacts on other observable variables in the results of a company. An inverse relationship to that expected for good internal control levels can occur when there is high leverage, low liquidity, and losses. These factors were used, in previous studies, as proxies of the risk perceived by an auditor, also without converging conclusions.

Zaman, Hudaib and Haniffa (2011), by using financial leverage as a risk measure, observed a positive relationship with auditing costs, concluding that leveraged companies require greater monitoring – in order to protect themselves from financial and market risks – and that the auditor can charge higher fees as a risk premium. Conversely, Naser and Nuseibeh (2008) – as well as Hallak and Silva (2012) – found a significant negative relationship between leverage and expenditures on audit. Sandra and Patrick (1996) and also Thinggaard and Kiertzner (2008) used leverage and liquidity to measure the risk of auditing clients; however, the results were insignificant. Waresul Karim and Moizer (1996) found that client risks are statistically insignificant to determine fees.

Other authors (Brinn, Peel, & Roberts, 1994; Bell, Landsman, & Shackelford, 2001) used clients' liquidity to represent the risk of audits and they obtained evidence indicating that this variable is significant to determine fees. Another proxy used in previous studies in order to assess firms' risk is that evaluating whether the client had losses within the last 3 years (Ireland & Lennox, 2002; Kwon et al., 2014).

Since the first paper (Simunic, 1980), the variable

“total assets” is the most widely used to measure company size. Joshi and AL-Bastaki (2000) mention several authors who concluded that client size is the most significant variable to explain fees. In turn, Brinn et al. (1994) indicate that clients' size and complexity were the most significant factors to determine audit expenses.

Another factor under study is firms size; the large ones, known as Big N, have become consolidated in the market. Similarly, studies have shown the positive relationship between firm size and the quality of its services (Palmrose, 1986; Brinn et al., 1994; Waresul Karim & Moizer, 1996; Thinggaard & Kiertzner, 2008; Hassan & Naser 2013).

DeAngelo (1981b) observes that audit quality is not independent in relation to the size of the company carrying it out; the larger the audit firm – measured by the number of clients – the smaller incentive for an auditor to behave inappropriately for establishing or maintaining a client. In other words, the higher financial independence of large audit firms puts them at a less vulnerable position in relation to client pressures. This fact contributes to a greater perception of audit quality.

Furthermore, other studies show that the Big N charge premium fees, when compared to smaller firms in the sector (Francis, 1984; Palmrose, 1986; Whisenant, Sankaraguruswamy, & Raghunandan, 2003; André, Broye, Pong, & Schatt, 2011; Kwon et al., 2014).

Waresul Karim and Moizer (1996) report that premium fees are justified because Big N firms have higher quality teams and they apply better procedures, so it is expected that they better identify errors. Other studies notice that premium fees paid to Big N firms might be related to the fact that the market reacts more favorably when a client chooses a large firm (Nichols & Smith, 1983; Lennox, 1999).

However, the results of studies on audit quality and firm size are not convergent. Braunbeck (2010) concluded that, in Brazil, BIG N firms provide higher quality services; Lawrence, Meza and Zhang (2011) analyzed the differences between audit quality of Big N companies and non-Big N companies, concluding that such a difference is insignificant.

Another factor under study is changing the auditor. When a client decides to change the auditor, the new one is elected, inter alia, by taking into account firms with better prices and conditions. Köhler and Ratzinger-Sakel (2012) found strong reductions in fees when auditors changed. Deis and Giroux (1996) and Simon and Francis (1988) highlighted that change is associated with significant reductions in fees; this behavior might be justified by firms on the grounds that, to establish new clients, they could charge lower initial values, adjusting them later.

This practice is named “low balling,” where the impact of such a procedure on auditor's independence is discussed. DeAngelo (1981a) stressed that such beha-



rior is a competitive response from auditors and it does not necessarily hinder independence. It is worth noticing that, in the Brazilian context, such conduct is not permitted by the Conselho Federal de Contabilidade [Brazilian Federal Board of Accountancy] (2003) – through the NBC P1 – and it consists in non-compliance with the accountant's code of ethics.

Nevertheless, audit cost does not necessarily follow this initial reduction; when it comes to new audits, auditors tend to apply more time to grasp business, risks, and thus define auditing strategies. This process tends to

be quicker in recurrent audits, due to the expertise and knowledge acquired in previous years.

DeAngelo (1981a) also points out that, in audits where initial costs are significant, the auditor who is already in the entity enjoys a competitive advantage in further audits.

It is noticed that understanding of determinants of audit costs is controversial; although there is the same expectation with regard to the way how certain variables must affect these costs, new empirical approaches are needed to make progress in knowledge about the theme.

### 3 METHODOLOGY AND LIMITATIONS

To analyze the determinants of audit fees, a multiple regression model was applied, through which this study aims to identify how and which variables impact on audit fees (dependent variable).

Table 1 summarizes this analysis and reorders factors with the variables and metrics observed in previous studies and also in the NBC P1.

**Table 1** Factors and their respective metrics to determine the audit fees

Global Factors	Variables		Metrics	
	Description	Subtitle	Description	Subtitle
Cost of Services and Estimated Hours	Size and relevance	SR	Total assets	SR
	Complexity	CM	Directors' remuneration	CM
	Risk observed by the auditor	RI	Leverage	LA
			Liquidity	LQ
			Losses within the last three years	LOSS
	Company with good corporate governance practices and internal controls	CG	Indicates whether the company is listed at different corporate governance levels	CG
	Peculiarity of being a potential, routine, or continued client	FY	First year auditing of an audit firm	FY
Technical qualification of auditors that execute services	-	<i>No potential proxies were identified</i>	-	
Market Opportunities	Audit firm	BIG N	Indicates whether the firm is a BIG N	BIG N
	Sectors	SEC	Indicates into which sector the audited client is framed	<i>Several</i>

Source: Prepared by the authors.

Table 1 aims to demonstrate the relationship between the variables impacting on fees and the related metrics; such demonstration is relevant, because the variable risk may be measured in more than one way, which will result in the presentation of more than one regression in this research, although this is the same model.

The rules requiring disclosure of audit fees do not require disclosure of the amount of hours and the rates use, and this information is restricted to the relationship between auditor and audited client. If such information were disclosed, it might be possible to analyze the effects

of the variables on each of these perspectives (hours and rates) and, as a consequence, intuitively grasp their impact on the calculation of fees.

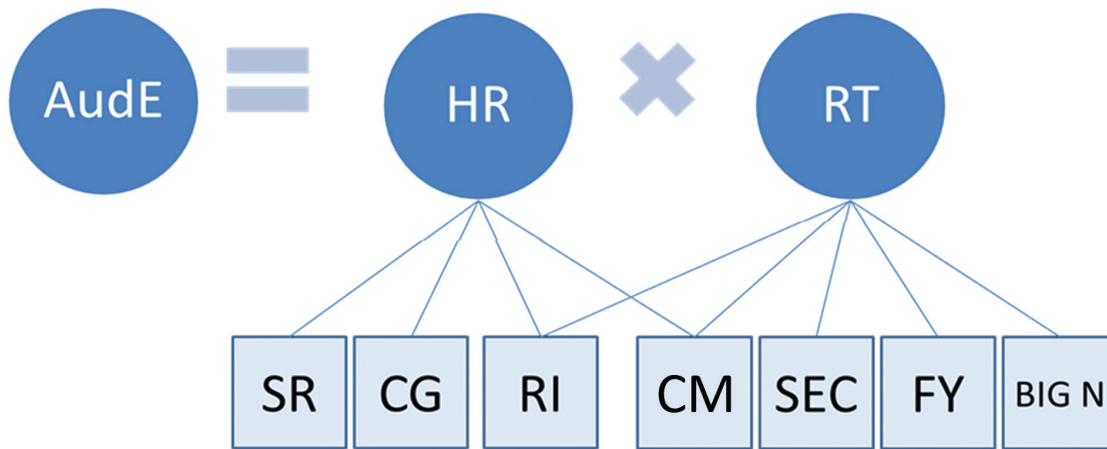
Although studies on determinants of audit costs have developed an equation that allows checking the relationship between variables and the audit expense, the variables used are not clearly verifiable in the basic method for calculating audit fees generally used by auditors. In other words, the auditor applies a formula based on the amount of hours – affected by the extent of estimated work – and an hourly rate, which covers from

costs of experts to market opportunities.

Figure 1 aims to establish a theoretical connection between the primary and intuitive way how fees are calculated by auditors and the variables shown in previous

studies and the NBC P1.

Figure 1 condenses the basic formula introduced earlier in this topic (circles), interconnected to the variables (squares) of Table 1.



**Figure 1** Variables under study and primary way of measuring fees.

Figure 1 shows that variables such as Size and Relevance (SR) and Corporate Governance (CG) mainly impact the amount of hours that the auditor needs to execute the audit. In parallel, other variables – such as the fact that the audit firm is a BIG N, as well as the company sector (SEC) – impact the rate value to be applied, but they do not affect, in theory, the amount of hours needed for the audit. This occurs because the number of hours is not affected, but the rate is, indeed, because there may be both the charge of premium fees as it is a BIG N firm and increased rates in some sectors – given the need for participation of expert auditors, whose cost might be higher.

The governance metrics has a natural tendency to reduce the amount of hours. A company with good governance and controls enables the auditor to test internal controls and considerably reduce the substantive audit procedures.

The risk metrics perceived by the auditor may impact the two quadrants: amount of hours and charged rate. The higher the risk, the higher the level of procedures an auditor must perform to achieve confidence. In parallel, the auditor may consider charging a higher price (rate) as a premium for the risk taken.

For this study, data on audit expenses of the companies analyzed were obtained in reference forms available on the CVM website; in turn, market and financial data were obtained from Economática. The initial population totaled 380 companies listed on the BM&FBOVESPA that reported their financial statements for the year 2012, until August 26, 2013; out of these, 45 were excluded for not informing all data required for analysis, resulting in a sample of 335 companies.

The dependent variable under study was the total an-

nual expenditure on audit, in Brazilian reais. The explanatory variables and the metrics adopted are described; for variables with two or more metrics, models were applied for each metrics, in order to verify which is best related to the factor under study.

The explanatory variables and their respective metrics are described below:

- ◆ Company size and relevance (SR): in line with previous studies and, particularly, with Chan, Ezzamel and Gwilliam (1993) – who observed that the variable audited company size is mostly represented by total assets – total assets in millions of Brazilian reais were used with metrics;

- ◆ Client complexity (CM): the total remuneration of the board of directors was used, as well as that of the statutory board of directors and supervisory board of directors, in millions of Brazilian reais.

Studies conducted in the UK have used as a metrics the variable number of subsidiaries (Simunic, 1980; Brinn et al., 1994), perhaps due to the high internationalization level of companies in that region. Taking the characteristics of the Brazilian economy into account, it may be assumed that the internationalization level of Brazilian companies is considerably lower, something which could limit the usefulness of this metrics.

We chose to use, in an innovative way, the remuneration received by directors as a metrics of complexity and figure. The hypothesis that rather complex companies tend to spend more on administrators was established, this is due to the fact that a larger number – and more qualified – of these professionals is needed;

- ◆ Client's risk (RI): three metrics were used – financial leverage (LA), general liquidity (LQ), and losses (LOSS).



These metrics were used in previous studies, and their results are often divergent; in the scenario of this study, in an innovative way in the Brazilian context, the three metrics on the model were used, in order to see which are significant and applicable;

- ◆ Internal control and governance levels (CG): just as Hallak and Silva (2012), we used a dummy variable representing the possibility that the client is at some corporate governance level different from the BM&FBOVESPA, disregarding differences between these divergent listing levels; this variable is a proxy to reflect the best internal control levels and the best governance practices in companies;

- ◆ Auditor change: just as in previous studies (Deis Jr. & Giroux, 1996; Gregory & Collier, 1996; Whisenant et al., 2003), a dummy variable was used to indicate whether in the year under observation the first auditor is named. The aim is verifying the practice of auditors to reduce their fees – in the first year of audit –, in order to establish the new client and subsequently adjust such a reduction. Even after the requirement created by the CVM, i.e. there should be a rotation of auditors in Brazil, it is expected that this practice is identified in scenarios with voluntary auditor change and in cases of mandatory rotation. This is so because the process to hire a new auditor requires competition – between many audit firms – which focuses, among other aspects, on fees. This competition usually includes the large audit firms, which dominate the Brazilian market;

- ◆ Audit firm: the variable BIG N was used to verify whether the large companies charge premium fees when compared to the other ones. Then, regressions were performed with four dummy variables, one for each large firm (DTT, EY, KPMG, PWC), seeking to identify which firms charge higher or lower fees, as well as to check whether the effect of premium fees applies to each of the Big N firms;

- ◆ Sector: for each sector where the companies operate, models were tested by using the natural values with dummy variables – representing the sector where the client fits – to identify higher or lower risk perception, from the auditor's viewpoint. In the final models, the dummy variables were maintained for the sectors with a significant effect.

Previous studies have shown a nonlinear association between the fees charged and the varying complexity and size; hence, these variables were presented in natural logarithm, just as in Francis (1984), Palmrose (1986), Zaman et al. (2011), Haskins and Williams (1988).

Due to the characteristics of the goals set out in this research, expectations about the behavior of factors under study in relation to the audit costs may be developed. Thus, the expected relations between these factors and the amount paid on fees will be displayed:

- ◆ SR = Company size and relevance: it is expected that audit expenses are positively related to companies size and importance;

- ◆ CM = Complexity: it is expected that the complexity and figure of the audited company positively impact on audit expenses;

- ◆ RI = Risk perceived by the auditor in relation to the audited company: it is expected to observe a positive relationship between risk and audit fees;

- ◆ CG = Corporate governance level and best practices in internal control: it is expected that the relation between audit expenses and corporate governance and internal controls is opposed to the risk perceived by the auditor. This expectation is grounded on the assumption that companies with best practices in internal controls and corporate governance result in lower audit costs, because they provide the auditor with greater comfort and, as a consequence, reduced effort and cost to execute the audit;

- ◆ FY = First year auditing and auditing firm change: it is expected that the audit fees behave negatively in relation to the fact that the company is undergoing the first year with the new auditing service;

- ◆ BIG N = The audit firm is among the large ones in the sector: it is expected that this variable has a positive behavior along with audit fees;

- ◆ SEC = Sector: it is expected that certain sectors impact audit fees, in order to verify that auditors observe higher or lower risks in these sectors. The expectation is that variables in the sectors have some significance, however, a specific behavior (positive or negative) is not initially expected.

## 4 EMPIRICAL RESULTS

### 4.1 Descriptive Statistics

Table 2 shows the correlation of explanatory variables with auditing expenses.

**Table 2** Correlation matrix between the explanatory variables and the dependent variable

Factors		Variable / Metrics		Correlation	P value
Subtitle	Description	Subtitle	Description		
SR	Size and relevance	SR	Total assets	0.79	100%
CM	Complexity	CM	Directors' remuneration	0.69	0%
RI	Risk perceived by the auditor regarding the company	LA	Leverage	0.05	0%
		LQ	Liquidity	(0.03)	36%
		LOSS	Losses within the last three years	(0.10)	62%

**Table 2** Continuation

CG	Corporate governance level and best practices in internal control	GC	Dummy variable indicating whether the company is listed at different corporate governance levels	0.19	5%
FY	Peculiarity of being an occasional, routine, or continued client	FY	Dummy variable that indicates whether this is the first year auditing of an audit company	(0.11)	0%
BIG N	Audit firm	BIG N	Dummy variable indicating whether the auditing firm is a BIG N	0.17	3%
		PWC	Dummy variable indicating whether the audit company is PricewaterhouseCoopers	0.17	0%
		KPMG	Dummy variable indicating whether the audit company is KPMG	(0.03)	0%
		EY	Dummy variable indicating whether the audit company is Ernst & Young	(0.06)	61%
		DTT	Dummy variable indicating whether the audit company is Deloitte	0.02	25%

Source: Prepared by the authors.

Some preliminary observations on the initial correlations are worth highlighting:

- ◆ Strong positive correlation between the variables total assets and directors' remuneration, which represent, respectively, size and relevance and companies complexity, being in line with initial expectations. Another observation is the low correlation between variables;

- ◆ The variable FY showed a weak correlation, but negative, indicating a trend of reduction in audit fees in audit firm changes;

- ◆ In line with the expectation that BIG N firms charge premium fees, the variable BIG N provided a positive but weak correlation;

- ◆ The variable CG showed a weak and positive correlation;

- ◆ The variables LA, LQ, and LOSS – which represent companies risk – provided insignificant correlation values.

As for the sectors, there was a large concentration of the financial industry, with about 30% of audit fees and the highest average value. Second, the electricity industry, with 8% of the total, and, unlike the financial industry, with fees scattered among several firms (50), corresponding to 14% of the total amount. It is noticed that 47% of the companies under analysis are at different corporate governance sectors. In 55% of cases, it was the first year the new auditor was providing services, due to the fact it was a year of audit rotation.

Table 3 displays the distribution of audit fees between each of the BIG N companies and the other companies (others).

**Table 3** Distribution of audit fees by company

COMPANY	Value of fees		Clients		Average K value R\$
	K R\$	%	Amount	%	
PRICEWATERHOUSECOOPERS	167,346	41%	74	21%	2,261
KPMG	90,751	22%	59	16%	1,538
DELOITTE TOUCHE TOHMATSU	75,637	19%	60	17%	1,261
ERNST & YOUNG	55,794	14%	75	21%	744
OTHERS	16,227	4%	91	25%	178
<b>TOTAL</b>	<b>405,755</b>	<b>100%</b>	<b>359</b>	<b>100%</b>	<b>1,130</b>

Source: Prepared by the authors.

The expected concentration of the audit market in the Big N companies was found, which account for 96% of the fees and 75% of the audited clients. PricewaterhouseCoopers stood out, with fees 84% higher than those of KPMG, the second largest in terms of the amount charged. The analysis of the amount of clients reveals a rather uniform distribution between the 4 large firms, and the

portion of other audit firms (not Big N) becomes more representative.

## 4.2 Results of Regressions

Just as in other studies (Chan et al., 1993; Lennox, 1999; Whisenant et al., 2003; Yatim et al., 2006), the results obtained had heteroscedasticity, indicating that the



determinants of fees are not homogeneous in the sample under study.

This fact may be justified by the fact that the pricing of fees considers market factors and business opportunities as variables, due to client size. For instance, the auditor may charge higher fees for larger clients, because of their financial capacity. Thus, it was decided to separate the sample into

two groups, namely: companies with total assets up to R\$ 1 billion; and over R\$ 1 billion.

Due to the natural relationship between some metrics, such as Company Size (SR) and Complexity (CM) - represented by the variable directors remuneration - the correlation between variables was analyzed to detect worrying multicollinearity levels, whose results are displayed in Table 4.

**Table 4** Correlation between independent variables

	SR	CM	LA	LQ	LOSS	CG	FY	BIG_N
SR	1.00	0.61	0.07	-0.02	-0.11	0.12	-0.10	0.10
CM	0.61	1.00	0.04	-0.03	-0.13	0.19	-0.09	0.15
LA	0.07	0.04	1.00	-0.02	0.03	-0.02	0.03	0.12
LQ	-0.02	-0.03	-0.02	1.00	0.09	-0.07	-0.08	-0.06
LOSS	-0.11	-0.13	0.03	0.09	1.00	-0.10	-0.03	-0.27
CG	0.12	0.19	-0.02	-0.07	-0.10	1.00	-0.04	0.32
FY	-0.10	-0.09	0.03	-0.08	-0.03	-0.04	1.00	0.01
BIG_N	0.10	0.15	0.12	-0.06	-0.27	0.32	0.01	1.00

Source: Prepared by the authors.

In line with Gujari and Porter (2011), the correlation indexes shown in Table 4 were below 0.8 – something which allows to rule out the hypotheses of a high multicollinearity level. The variance inflation factors (VIFs), whose results ruled out the possibility of high multicollinearity levels in the sample under analysis.

With a sample separated – due to its size – into two parts, through total assets, it was sought to verify whether clients of various sizes change the auditor's perception on determinants of fees. For instance: in smaller clients,

the auditor may take into account the risk taken, because the premium he will receive has a natural limiter due to company size and financial capability. Due to heteroscedasticity, all models have been corrected and calculated by using the robust error estimator proposed by White (1980).

Table 5 shows the final models maintained in the sample divided by size. Overall, two regressions were maintained for large companies – as two risk variables were significant – and one for smaller companies.

**Table 5** Correlation between independent variables

	Companies with assets over R\$ 1 billion and risk measured by liquidity _(1)_	Companies with assets over R\$ 1 billion and risk measured by leverage _(2)_	Companies with assets below R\$ 1 billion and risk measured by leverage _(3)_
LOG (SR)	0.42777*** (0.0582)	0.4392*** (0.0575)	0.2365*** (0.0654)
LOG (CM)	0.2575*** (0.0665)	0.2535*** (0.0670)	0.2626*** (0.0671)
LA		0.0024** (0.0009)	-0.0229* (0.0108)
LQ	-0.04549* (0.0230)		
FY	-0.3628** (0.1271)	-0.3681** (0.1270)	-0.0698 (0.1365)
CG	0.2472* (0.1334)	0.2534* (0.1344)	0.2259 (0.1664)
DTT	0.5364** (0.1874)	0.5248** (0.1869)	0.6812* (0.3053)
EY	0.1572 (0.2017)	0.1274 (0.2027)	0.6056** (0.1873)
KPMG	0.0766 (0.2016)	0.0730 (0.2012)	0.9553*** (0.2265)
PWC	0.45301* (0.1800)	0.4164* (0.1794)	0.8850*** (0.1953)
FIN	0.1236 (0.1659)	0.1204 (0.1656)	

Table 5

Continuation

B&F	0.5056* (0.2264)	0.4947* (0.2244)	
CHE			-0.7254*** (0.2578)
S&M	0.7312* (0.3002)	0.7179* (0.3001)	
SOFT			1.3624*** (0.2482)
Observations	226	226	109
Adjusted R <sup>2</sup>	50.95%	50.77%	66.67%

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Source: Prepared by the authors.

It was observed, in all models, that client size (SR) had a positive and significant impact on audit fees. These results reinforce the explanatory power of this variable and corroborate previous research (Simunic, 1980; Palmrose, 1986; Brinn et al., 1994; Joshi & AL-Bastaki, 2000; Köhler & Ratzinger-Sakel, 2012; Hallak & Silva, 2012, Hassan & Naser, 2013; Kwon et al., 2014).

In order to verify whether the risk perceived by the auditor affects fees, regressions were tested for three different proxies, in order to measure risk: losses (LOSS), liquidity (LQ), and leverage (LA). The results obtained showed a different behavior according to companies size. It is possible to observe that, just as Sandra and Patrick (1996), Thinggaard and Kiertzner (2008), and Hassan and Naser (2013), the metrics liquidity did not show significant results in smaller companies; the metrics loss was insignificant in all models tested.

In large companies, the metrics liquidity – used in regression 1 – showed strong significance and a negative relationship, corroborating the fact that clients with higher risk demand higher fees. Unlike leverage (the higher, the greater risk), liquidity has an inverse relationship, because higher indexes indicate greater financial capacity to pay its liabilities, and lower ones indicate less financial capacity, as a consequence, greater risk.

Model 2 corroborates the findings of model 1. In model 2, the metrics leverage was significant at 1% and it showed a positive relationship, demonstrating that the greater a company's leverage degree, the higher the fees charged by the auditor.

Models 1 and 2 found that, for large clients, the auditor charges higher fees in the presence of higher risk, reinforcing findings of previous studies (Brinn et al., 1994; Bell et al., 2001; Zaman et al., 2011). The hypothesis that for clients with higher risk the auditor charges higher fees is corroborated, both due to increased efforts to monitor risks and to charging a premium for that risk.

Curiously, it was observed in regression 3 that, for small companies, leverage showed significance. However, the beta obtained is negative, suggesting that the auditor might charge lower fees for small-sized leveraged clients, corroborating the paper by Hallak and Silva (2012), but contrary to the hypothesis that the auditor might charge

higher fees as a premium for the risk taken.

The results obtained herein demonstrate the importance of analyzing companies divided by size, allowing us to verify that the auditor evaluates some aspects of companies differently according to size.

Due to the nature of financial institutions' activities – and, as a consequence, in changing the dynamics of leverage and liquidity among these companies when compared to other sectors – a regression was performed without financial companies, in order to check whether such a dynamics could impact on the behavior of risk metrics: liquidity and leverage. The results show that the dummy variable for this sector, used in the models presented, captured in a satisfactory way occasional impacts of this dynamics, since the results without financial companies were consistent with the global results.

The steel and metallurgy sectors (S&M) and food and beverages (B&F) positively affected the fees paid by large clients. The software sector (SOFT) showed to positively affect audit expenses in smaller companies. It may be assumed, when determining fees for clients in these sectors, that the auditor perceives greater risk – or estimate increased efforts through more hours required to execute the audit – due, for instance, to a greater complexity in the sector.

The chemical sector (CHE) showed to negatively affect smaller clients, allowing us to assume that this sector requires less effort or it is perceived as less risky by the auditor. For the other sectors in the sample, there were no significant relationships with fees.

It is possible to make a brief comparison with the results obtained herein and findings by Hassan and Naser (2013). When compared to services and trade, the authors identified that auditors charge lower fees for industrial companies, just as observed in this study in the CHE sector, typically industrial. However, sectors such as S&M, also industrial, had a different behavior. Comparisons are limited, because this study addressed sectors instead of industry types.

The analysis of client complexity – represented by the variable directors remuneration (CM) – revealed that this factor positively affected fees on all models, confirming the hypothesis that rather complex clients requi-



re more effort and fees, corroborating previous studies (O'Sullivan, 2000; Larcker & Richardson, 2004; Köhler & Ratzinger-Sakel, 2012; Hassan & Naser, 2013; Kwon et al., 2014).

As for the relationship between corporate governance (CG) and fees, an insignificant relationship was observed in small companies; in turn, regarding the large companies, there was a significant and positive relationship. The initial expectation, i.e. clients with better practices in internal controls and corporate governance might have lower audit costs by providing the auditor with greater comfort and, as a consequence, there would be a reduced effort and cost for the audit was not confirmed. These results corroborate other aspects of previous studies, which show that clients with higher governance structures tend to spend more on auditing (Goodwin-Stewart & Kent, 2006; Yatim et al., 2006; Hallak & Silva, 2012).

In line with previous studies that showed a reduction of fees in the first year auditing (Deis Jr. & Giroux, 1996; Gregory & Collier, 1996; Whisenant et al., 2003), the results obtained in relation to larger companies show a significant and negative relationship. These results suggest that the auditor charges less in the first year to establish new clients, offsetting the amounts in the following years of the contract. The results suggest that the auditor has greater motivation to establish large clients, reducing fees in the first year auditing.

The results demonstrate that the practice of reducing fees in the first year auditing occurs in environments where the change of auditors is required, as in the case of Brazil, where the CVM established such change every five years. It was found that, regardless of the motivation to change, the new auditors tend to reduce initial fees, seeking to establish a new client. It is worth noticing that, as of January 1, 2012, the deadline set by the CVM was extended for ten years, through the creation of a statutory audit committee.

The results obtained are in line with that proposed by Kwon et al. (2014), whose research specifically assessed

the impact of mandatory rotation of auditors. Such research evaluated the behavior of fees before and after the requirement in South Korea and it found that the rotation of auditors leads, initially, to higher fees. However, the analysis allowed us to observe that, even in a scenario of mandatory rotation, fees in the years following the change of auditor were higher, making the practice of "low-balling" clear.

This fact demonstrates that the practice of "low-balling" occurs even in scenarios requiring auditor rotation. It is clear that comparisons between the findings of Kwon et al. (2014) and this research have limitations, because herein only the year 2012 is under analysis.

Concerning the fact that large firms charge premium fees (variable BIG N), models were tested for the consolidated samples and divided by size. All results showed this variable as significant and positive, reinforcing previous studies (Francis, 1984; Palmrose, 1986; Brinn et al., 1994; Waresul Karim & Moizer, 1996; Whisenant et al., 2003; Thinggaard & Kiertzner, 2008; André et al., 2011; Hallak & Silva, 2012; Kwon et al., 2014), which showed that Big N firms charge higher fees. The reason for this fact may be related to the good reputation of these firms or the concentration in the Brazilian market, which limits the client's choice of options.

In an innovative way when compared to previous studies, a dummy variable was tested for each of the big firms, and it was maintained in the final models, seeking to notice the existence of significant differences between the Big N firms.

Based on the results displayed in Table 5, PricewaterhouseCoopers (PWC) and Deloitte (DTT) stand out, with significant results in all models. EY and KPMG showed no significant results in large companies, something which suggests they do not realize to charge higher fees when compared to the other firms. This fact may be related to major acquisitions made by EY and KPMG within the period under study, something which might have forced their fees down.

## 5 CONCLUSIONS AND FURTHER POSSIBILITIES

This study sought to analyze which factors determine audit fees and present the distribution in the Brazilian audit market among listed companies. The results obtained indicate that fees are positively related to size, client complexity, corporate governance level, and the fact that the auditor works in a large firm.

It was found that complexity – measured by directors' remuneration – is positively related to the fees charged, corroborating the hypothesis that rather complex clients require greater effort by the auditor and, as a consequence, higher fees.

The effect of Big N firms on budgeted fees showed a positive relationship, corroborating previous studies

that, since the 1980s, have pointed out the charge of premium fees by these firms (Palmrose, 1986; Brinn et al., 1994; Waresul Karim & Moizer, 1996; Thinggaard & Kiertzner, 2008; Hallak & Silva, 2012). The results suggest that, in Brazil, higher fees are paid to these firms under the argument that Big N firms have higher quality teams and they apply better procedures (Waresul Karim & Moizer, 1996).

Separating the sample into two groups (clients with smaller assets and those over R\$ 1 billion) pointed out discrepancies in the behavior of fees, unobservable in consolidated assets. Among the differences, stand out: the charge of lower fees in the first year auditing large

clients, difference in perceived risk between large and small clients, and higher audit expenses among large clients with better corporate governance levels.

For the hypothesis of reduced fees in the first year auditing with auditor change, the results with large clients indicate that in the first year after auditor change, fees tend to be reduced, supporting the hypothesis that the auditors might charge less in the first year to regain this money in the subsequent years.

The risk perceived by the auditor demonstrated to affect the values of fees, differently in large and small clients. In smaller ones, leverage had a strong significance, however, the results suggest that the auditor charges lower fees for more leveraged and lower-risk clients, contrary to the hypothesis that the auditor might charge higher fees as a premium for the risk taken. Such behavior might be related to the fact that clients undergoing financial problems tend to exert more pressure on their auditors to have lower expenses on audit.

In turn, in large companies, the results reinforced previous studies (Brinn et al., 1994; Bell et al., 2001), demonstrating that clients with greater risk as measured by liquidity and leverage tend to spend more on audit due to the greater effort to monitor risks and the premium charged on risk.

As for corporate governance levels, there was a significant and positive relationship with fees in large clients. The initial hypothesis that the auditor might charge lower fees on clients with better corporate governance levels (Bedard & Johnstone, 2004) was not confirmed, but

such results corroborate the hypothesis proposed by Yaitim et al. (2006), i.e. higher corporate governance levels require greater effort by the auditor, due to increased need of meetings and interactions with players.

Despite the advances made in recent years in the Brazilian audit market, mainly due to the legal requirement that large companies are audited, the disclosure of opinion and fee is not mandatory for companies not listed. This fact limits the research field of audit fees among listed companies.

Given the importance of audit to society, it is expected that, in the future, regulated and strategic sectors for the country – such as the electrical, financial, telecommunication, and transport industries – require disclosure of fees, opening a new front of research in the determinants of audit fees among companies not listed and those operating in specific sectors, just as in the UK (Brinn et al., 1994).

Further studies may consider new metrics and a period greater than one year, in order to verify the occurrence of changes in determinants of audit fees over time, related to unobservable factors in a single year, such as: effect of financial crises, audit rotation, legislation change, among others.

No studies were found in other Latin countries. Further studies may address these countries, making a comparison similar to that by Haskins and Williams (1988), who studied and compared determinants of audit fees in English-speaking countries: USA, UK, Ireland, New Zealand, and Australia.

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