Audit Quality in the Context of Investment Funds

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Abstract

The quality of accounting information represents an essential ingredient to obtain efficiency in resources allocation. This statement deserves a particular attention when we consider operations with financial instruments. Investment funds manage a portfolio comprised of financial instruments, therefore the quality of their accounting reports should be subject to a careful process of elaboration and auditing. In this paper, we analyze the effect of being audited by a Big Four audit company on fund's risk and fund's performance. Using a sample that represents more than 70% of the industry of investment funds in Brazil (both in terms of number of funds and total net assets), the main results indicate that audit quality is associated with lower levels of risk taken by fund managers. Moreover, the benefits of audit quality also include a positive effect on the final performance of investment funds.

Keywords: Risk; Accounting Information; Financial Instruments.

1. Introduction

One of the resources that contributes to an efficient financial market is the quality of accounting information, since investors use financial statements and accounting indicators to take investment decisions. Together with the quality of accounting information is the quality of auditing. "Large accounting firms offer their audit teams national access to technical accounting consultants, staff in multiple locations, and audit efficiencies resulting from unified nationwide training" (BILLS; CUNNINGHAM; MYERS, 2016, p. 768). Therefore, variables such as size, institutional environment, access to IT platforms and participation in international accounting networks can affect audit quality (BILLS; CUNNINGHAM; MYERS, 2016; MAO; QI; XU, 2017), which, in turn, indicates that the quality of auditing also varies among audit firms.

The portfolios of investment funds are broadly comprised of financial instruments, and there are some accounting choices related with accounting of financial instruments. These accounting choices can affect the quality of accounting information. In the specific case of investment funds, accounting information is directly related with the numbers of total net assets and the value of fund's shares. Hence, the daily, monthly or yearly returns of an investment fund could present different levels of quality based on the quality of accounting and auditing of its operations. Considering this scenario, the aim of this paper is to test the effect of audit quality on investment funds' accounting numbers. These accounting numbers directly affect risk measures and performance indexes, and in this paper we consider as dependent variables three proxies for fund's risk (standard deviation of monthly returns; of monthly risk-premium; and of monthly negative risk-premium) and also three proxies for fund's performance (the average risk-premium; the Sharpe index; and the Sortino index).

As secondary objectives, we: i) test whether there are some variations in the coefficients intra Big Four audit firms; and ii) test a potential interaction between the size of investment funds family and the audit quality. We develop the analysis of this paper considering a sample that represents more than 70% of the investment funds industry of Brazil (76.2% in terms of number of funds and 70.3% in terms of total net assets). The sample is comprised of three fund classes (equity mutual funds; multimarket funds; fixed income funds), and each class includes more than 90% of its respective number of funds.

Studies about audit typically focus on audited firms, not taking into account financial sector institutions, such as investment funds. Even the few studies about the subject that consider some financial institutions usually focus on banking institutions. Therefore, there are research gaps regarding the effects of quality audit on investment funds, and we expect to contribute with this field through this paper. In addition, investment funds represent a significant part of economy, thus being an important study object (GOLDIE; LI; MASLI , 2017).

2. Literature review

Studies show that performance is among the main aspects considered by investors when choosing a particular investment fund; therefore, funds with higher past returns tend to attract more investments (SIRRI; TUFANO, 1998; BERK; GREEN, 2004; IVKOVIC; WEISBENNER, 2009). Because of this, in some circumstances, fund managers may use accounting discretion to obtain better returns estimations (CHANDAR; BRICKER, 2002). For example, funds may have underlying illiquid securities which, since they are not actively traded and do not have their market prices always available, appear to be more valuable than they actually are, resulting in funds' returns which do not fully reflect the available market information (GETMANSKY; LO; MAKAROV, 2004). In this sense, Goldie, Li and Masli (2017) argue that investors' confidence in the truthfulness of fund's performance numbers increases from the instance of fund audits are perceived as high quality.

Typically, perceived high-quality audit services are related to the four large audit firms (Deloitte, EY, KPMG and PwC), called the Big Four. Geiger and Rama (2006) indicated empirical evidences that the Big Four audit firms have significantly fewer reporting errors than non-Big Four audit firms. Behn, Choi and Kang (2008) found that earnings forecast accuracy, perceived as a proxy for higher audit quality, is higher when a firm hires Big five audit firms than non-Big five audit firms. Figure 1 indicates some benefits of high-quality audit services, based on empirical evidences.

Author(s)	**Big Four audit benefits**	**Sample**
Chou, Zaiats and Zhang (2014)	Attracts foreign investments and better performance during periods of crisis.	35,665 worldwide mutual funds with investments in developed markets firms.
Geiger and Rama (2006)	Presents less reporting errors.	1,042 manufacturing firms receiving going concern report modifications and 710 financially stressed firms filling for bankruptcy.
De Franco *et al*. (2011)	Increases private firms sale proceeds.	U.S. privately held firms with available financial statements and transactional details during 1994 to 2005.
Almeida and Almeida (2009)	Mitigates earnings management practices.	Firms listed on Brazil Stock Exchange with available data.
Lee and Lee (2013)	Improves value relevance of earnings and book value of equity.	Firms listed on Taiwan Securities and Exchange market with available data.
Van Tendeloo and Vanstraelen (2008)	Mitigates earnings management practices.	Privately held firms from 15 countries of the European Union with available data.

Source: the authors, based on the studies mentioned in the Figure.

FIGURE 1 - Benefits of high-quality auditing services

Financial statements represent the main source of information about listed companies. Therefore, in order to hold their usefulness and to function correctly, financial statements must be, among other factors, reliable. In this sense, Behn, Choi and Kang (2008) affirm that external auditors may have a key role in the firms' financial reporting reliability, since they provide an independent evaluation of the financial statements' trustworthiness; in other words, external audit shows whether firms' reporting information are in concordance with accounting principles and if they reflect their operation results and cash flows. Moreover, external audit may work as a corporate governance mechanism that revises and evaluates firms' internal controls and financial reporting, preventing material misstatements (CARCELLO *et al*., 2002; HABBASH, 2010).

Following another reasoning, there is a discussion about the audits effectiveness between, the so called, high-quality audits and non-high-quality audits. According to Francis (2004), evaluating audit quality is important because, since audit quality is negative related to audit failures, low-quality audits may lead to higher failure rates with possible material economics consequences. Therefore, studies about audit quality consider different factors to define a high-quality audit, such as audit fees (LENNOX, 1999; O'SULLIVAN, 2000; HOITASH; MARKELEVICH; BARRAGATO, 2007), industry specialization (O'KEEFE; KING; GAVER, 1994; BALSAM; KRISHNAN; YANG, 2003; DUNN; MAYHEW, 2004) and, the focus of this study, Big Four audit firms (GEIGER; RAMA, 2006; BEHN; CHOI; KANG, 2008; CHOU; ZAIATS; ZHANG, 2014).

Using a sample of 35,665 mutual funds worldwide, of which 20 were from developed markets and 10 from emerging markets, with investments in various firms from developed markets,

over the period between 1998 and 2009, Chou, Zaiats and Zhang (2014) found evidences that mutual funds' increase investments in firms which had hired a Big Four auditor in the previous year. In other words, firms audited by Big Four audit firms obtained more foreign investments. The main reason attributed by the authors to this effect is that Big Four firms are perceived as high quality auditors and have higher levels of certifications, which are highly valued by foreign investors. Beside this, Chou, Zaiats and Zhang (2014) affirm that the importance of auditor choice in the investment decisions of mutual funds have increased since the global crisis of 2008, so that firms audited by Big Four outperformed the ones audited by non-Big Four during crisis times.

Geiger and Rama (2006) examined 1,042 manufacturing firms receiving going concern report modifications and 710 financially stressed firms filling for bankruptcy during the period between 1990 to 2001. Their aim was to analyze audit firms' reporting errors such as going concern modified audit reports related to firms who do not fail later and audit reports without a going concern modification for firms that bankrupt afterwards. Among the results of the research, the authors found evidences that Big Four audit firms show lower rates of reporting errors than non-Big Four firms, suggesting higher audit quality from Big Four firms. According to Geiger and Rama (2006), one possible reason for this may be related to the fact that Big Four audit firms spend more resources in audit training and technology, which help them to identify firms that will bankrupt, thus minimizing reporting errors.

Moreover, Big Four audit may even affect firm value at sale time. The research conducted by De Franco *et al*. (2011), with data of financial statements and transactional details related to sales of U.S. privately held firms during the period between 1994 and 2005, showed that Big Four audit impacts sale proceeds. Regarding the directly effect of Big Four audit on sale proceeds of private firms, De Franco *et al*. (2011) verified that, for a private seller with a firm value ranging from US$14 to US$18 million, for stock purchases, incurs in US$3.9 to US$5.2 million value decrease if not hired a Big Four audit firm. For asset purchases, a private seller with a firm value raging from US$10 to US$12 million incurs in US$2.6 to US$3.1 million value decrease if not hired a Big Four audit firm. According to the mentioned authors, this occurs because buyers believe that Big Four auditors provide high-quality audits, making due diligence process easier, and have strong internal controls, qualified accounting personnel, high-quality advisors, among other qualities.

Still regarding the effects of Big Four audits on firms' value, but focusing on the relevance and reliability of the accounting information, Lee and Lee (2013) studied public companies listed in the Taiwan Securities and Exchange market during the period between 1996 to 2009. Their purpose was to examine the effects of audit quality, proxied by Big Four audit firms, on the value relevance of financial statements information, specifically, earnings and book value of equity. The results presented by Lee and Lee (2013) suggests that accounting measures of earnings and book value of equity are more relevant and explain better the variations in stocks returns for firms audited by Big Four rather non-Big Four. In this sense, accounting information, concerning earnings and book value of equity, audited by Big Four are perceived as more relevant and reliable.

According to Almeida and Almeida (2009), firms audited by Big Four audit firms have low levels of discretionary accruals than firms audit by non-Big Four audit firms. This means that firms audited by Big Four have more potential to mitigate earnings management practices. To find those results, the above authors analyzed all firms listed on Brazil Stock Exchange with available data during the period between 1999 and 2005. Almeida and Almeida (2009) affirm that a possible explanation for the findings is based on Big Four auditors' expertise, which may lead firms to mitigate earnings management practices. It should be emphasized that findings about the constraints of firms' earnings management practices by Big Four audits are

not exclusivity from developing countries, such as Brazil. Van Tendeloo and Vanstraelen (2008) indicated that European privately held firms audited by Big Four also present less earnings management practices than the ones audited by non-Big Four.

Given the assumptions that the Big Four audit firms provide high-quality audits, mitigate earnings management practices, increase the usefulness of accounting numbers, invest more resources in technology and training courses, we argue that investment funds that hire Big Four audit firms present different levels of risk and performance, when compared to other investment funds. This is the reasoning that we use to present our first hypothesis.

H1: Investment funds audited by Big Four audit firms present different risk levels and performance when compared to the other investment funds.

Firms' size has an effect on the quality of internal information systems (LOPES; RODRIGUES, 2007; HASSAN; SALEH; RAHMAN, 2008; MALAQUIAS; LEMES, 2013; MOHAMMADI; MARDINI, 2016; TAHAT, *et al*., 2016) and in the professional qualification of employees (COOKE, 1989). So, the firms' size could also present a positive effect on the availability of resources to internal risk management, which could also be related with the size of fund families. The focus of fund families contributes to the development of skills and scale economies when investing and selecting assets in the financial market (MOREIRA; TAVARES; MALAQUIAS, 2017). Following this reasoning, large fund families may present higher availability of financial resources to hire experienced and certified fund managers, since the skills of fund managers have a positive effect on fund's performance (CHUA; KOH, 2007; HU; YU; WANG, 2012; FANG; KEMPF; TRAPP, 2014; FANG; WANG, 2015). In Figure 2 we indicate some considerations about managers' skills.

Considerations about manager skills	**Author(s)**
"(...) providing incentive contracts or promotions to attract outstanding managers with stock picking abilities, and replacing poorly performing managers are all necessary actions for fund performance improvement"	Hu, Yu and Wang (2012, p. 96)
"We even find that skill is rewarded only in the less efficient HY segment. Fund families seem to be aware of this relation between skill, efficiency, and performance, and allocate more highly skilled managers to HY funds"	Fang, Kempf and Trapp (2014, p. 673)
"measure is presented that allows managerial performance over time to be compared when funds can invest in different asset classes. Using this measure, it is possible to detect significant persistence of managerial skills at longer persistence than has been previously documented"	Chua and Koh (2007, p. 1365)
"Therefore, we conclude that fund manager characteristics affect comprehensive performance mainly through their impact on managers' stock-picking ability, which in turn affect excess return and, ultimately, comprehensive performance. The common characteristics that influence stock-picking ability, excess return, and comprehensive performance are possession of an MBA or a CFA. [...]. Therefore, having an MBA or a CFA is the most important quality of fund managers in China to outperform his/her peers in achieving better stock-picking ability, higher excess returns, and better comprehensive performance".	Fang and Wang (2015, p. 115)
Focused families have better conditions of evaluating and attracting the better fund managers in their specific segment.	Moreira, Tavares and Malaquias (2017)

Source: the authors, based on the studies mentioned in the Figure.

FIGURE 2 - Manager skills and investment funds performance

Guedj and Papastaikoudi (2004) argue that mutual funds, when viewed as a part of large groups, which are the fund families, may have objectives coming from the family they belong to, contrasting with individual incentives of the fund. For example, a fund family could use a

strategy that allocates its resources unequally to the funds. In this sense, depending on the strategy and availability of resources, fund family might choose to manage, rather than two funds with average performance, a high performing fund and a poorly performing fund. In view of these arguments, it is expected that larger funds families be more capable to affect the performance of their funds in a positive way, since they have greater availability of resources to allocate in their funds.

According to Ferreira *et al*. (2012), large fund families also affect positively their funds' performance due economies of scale and scope, since some spending, such as research expenses, administrative expenses, trading commissions, lending fees, etc., can be distributed among the funds. In addition, large fund families with previous experience in opening funds usually generate new funds more frequently, since they face considerably low costs from economies of scale and scope. These arguments were corroborated empirically by Ferreira *et al*. (2012), from an analysis of a sample with 16,316 equity mutual funds in 27 countries during the period between 1997-2017. In view of this, funds from large fund families present superior performance, as we present in the second hypothesis.

H2: Funds of large fund families present different risk levels and performance when compared to the other investment funds.

Large fund families have incentives to hire better standards of certification. The Big Four audit firms have such certifications, as already documented by previous research, and these characteristics contribute to the implementation of better practices of risk management (NADIA; ROSA, 2014) and to the compliance of financial standards and to the mitigation of information asymmetry (LOPES; RODRIGUES, 2007; HASSAN; SALEH; RAHMAN, 2008; HODGDON *et al*., 2009; AMOAKO; ASANTE, 2012; ZANGO; KAMARDIN; ISHAK, 2015). The market of auditing is relatively concentrated, and it has few and large firms that operate at an international level (the Big Four firms); so, firms' size is a determinant factor in the selection of the auditor type, and also in the audit quality (AGUIAR-DÍAZ; DÍAZ-DÍAZ, 2015).

Despite being considered as high quality audits, Big Four audits are more expensive. According to Campa (2013), Big Four audit firms charge an audit fee premium from their clients; in other words, audit fees of Big Four are higher than non-Big Four audit firms. Considering this context, Booth, Booth and Deli (2012), when studying a sample of 6,543 mutual funds from U.S. market with the objective to examine the link between audit fees and managerial incentives, among the results, found evidences that audit fees experience economies of scale and scope. This implies that large fund families have higher incentives to hire Big Four audit firms, since they can share the excessive fees charged by Big Four audit firms among the family's funds, besides having more available resources to afford these extra costs.

Gerken, Starks and Yater (2014) argue that fund family reputation affects individual mutual fund investment decisions and performance, so that investors, which have past experience with a particular fund family, especially if got positive returns, are considerably more likely to purchase funds from the same family. Likewise, Krishnamurthy, Zhou and Zhou (2006) showed evidences that audit firm reputation significantly affects perceived audit quality and credibility of financial statements, so that the market valorize it. In view of this, large fund families may also have incentives to hire large audit firms, such as Big Four, in order to preserve, and even improve, their reputation in the market. Our third hypothesis relates to an interaction between funds audited by a Big Four audit firm and the size of funds' family.

H3: The interaction between funds audited by a Big Four audit firm and funds of large families affects risk levels and performance of investment funds.

3. Methods

Table 1 indicates important information regarding the representatives of the sample used in this study, when compared to the entire Brazilian industry of investment funds. In other words, according to Table 1, the sample of this study contains more than 90% of Brazilian funds of each class; the sample also represents 76.2% of number of investment funds in Brazil. Therefore, we are studying an important and significant share of the entire industry of investment funds in Brazil.

TABLE 1 - Representativity of the sample used in this study

Class	**Funds with at least 12 monthly ret.**		**All funds in Brazil** [(i)]		**Representativity of the Sample**
	nº Funds		**nº Funds**		**nº Funds (% of All Funds)**
Equity Mutual Funds	1,602	14.7%	1,743	12.2%	91.9%
Multimarket Funds	6,834	62.7%	7,197	50.3%	95.0%
Fixed Income Funds	2,467	22.6%	2,521	17.6%	97.9%
Other Classes	-	-	2,855	19.9%	-
Total	10,903	100.0%	14,316	100.0%	76.2%

Source: research data.

(i) Based on information collected from Economatica, this table only includes funds with information for Total Net Assets and monthly return, both at the end of December, 2016.

We collect data from Economatica database, considering three kinds of investment funds in Brazil (as shown in Table 1): equity mutual funds, multimarket funds (they look like international hedge funds), and fixed income funds. The quantitative tool used to test the hypotheses is the regression analysis with robust standard errors. The sample period goes from January 2016 to August 2017, which results in 20 monthly observations for each fund with complete data. All funds that do not have information about the name of the auditing company, fund's size (total net assets for each month), and monthly returns for at least 12 months were excluded of the sample. This selection resulted in the numbers presented in Table 1. Through the winsorizing procedure (at 2.5%), we eliminated the potential effects from extreme outliers in the variable monthly returns.

At this point, we have a panel dataset with cross-sectional observations along 20 months. Therefore, we employ the Levin, Lin and Chu (2002) test to verify whether this panel is stationary (or, whether its series contain unit root). To develop this test, we considered the panel comprised of investment funds with complete returns for all sample period, which have implied in a strong balanced panel with 9,629 investment funds. The result of this test indicated the rejection of the null hypothesis (Adjusted t = -5.5e+02; p-value = 0.000). Therefore, this specific database is not subject to potential concerns with unit root in monthly returns.

The main independent variables in this study are Big Four audit firms and Family Size. Big Four is a dummy variable which receives 1 for funds audited by Deloitte, EY, KPMG or PwC (alphabetical order), and 0 for the other cases. We also create a dummy variable for each one of the four different big audit firms, in order to verify some potential differences intra these audit companies. Regarding the size of fund family, first, we calculate the average of TNA for each fund in the sample period. Then, we calculated the sum of TNA for each family (the database contains 71 fund families), and we observed that a group of nine families responds for 55.08% of the average TNA in the sample. Based on this information, we established a

dummy variable (LargeFam) which receives 1 for each one of these nine large families, and 0 in the other cases.

We also include in the quantitative models three control variables: Fund's size (Fund's Size), measured through the natural logarithm of average of monthly fund's TNA; Performance Fee (Perf-Fee), which represents a dummy variable that receives 1 for funds with performance fees and 0 for the other cases; Management Fee (Man-Fee), which is the maximum value of management fees that each fund can charge yearly, in % of TNA. For those funds that disclose management fees in absolute values, we calculate the percentage of management fees relative to TNA, in order to standardize the measurement of this variable.

Regarding the dependent variables, we used six different measures which are directly affected by accounting information: standard deviation of fund's monthly returns; standard deviation of fund's risk-premium; standard deviation of fund's negative risk-premium; the Sharpe index (SHARPE, 1966), considering the adjustment presented by Israelsen (2005) regarding funds with negative risk-premium; the Sortino index; and the average risk-premium in the period. The proxy for risk-free is the SELIC rate.

As previous explained, to test the study hypotheses, we employ multivariate regression analysis with robust standard errors. In each month, we also include a dummy variable for fund's class (equity mutual funds; multimarket funds; fixed income funds, as presented in Table 1). The software we used to run the models is Stata.

4. Results

4.1 Descriptive analysis

The initial descriptive statistics (Table 2) of the sample indicates a significant preference for hiring a Big Four audit firm, because in 96% of the funds in the sample are audited by Big Four companies (Deloitte, EY, KPMG and PwC).

TABLE 2 - Descriptive statistics for the variables in the study

Variable	# obs.	Mean	Std. Dev.	Min	Max
Std. Dev. Ret. (w)	10,905	2.067	2.625	0.125	11.330
Std. Dev. Risk Prem. (w)	10,905	1.646	1.798	0.009	6.183
Std. Dev. Neg. Risk Prem. (w)	10,905	0.950	1.009	0.000	3.321
Average Risk Premium (w)	10,905	0.152	0.611	-1.325	1.760
Sharpe Index (w)	10,905	-0.102	1.064	-4.684	1.545
Sortino Index (w)	10,622	0.085	1.312	-4.993	3.469
Fund's Size (Ln)	10,905	17.688	1.724	7.379	25.347
Adm-Fee	10,227	0.792	1.017	0.000	10.000
Perf-Fee	10,905	0.203	0.403	0.000	1.000
Large Family	10,905	0.277	0.447	0.000	1.000
Big Four	10,905	0.964	0.187	0.000	1.000
Deloitte	10,905	0.124	0.329	0.000	1.000
EY	10,905	0.104	0.306	0.000	1.000
KPMG	10,905	0.407	0.491	0.000	1.000
PwC	10,905	0.329	0.470	0.000	1.000
Big Four * Large Family	10,905	0.277	0.447	0.000	1.000

Source: research data. Notes: Std. Dev. Ret. = standard deviation of fund's monthly returns; Std. Dev. Risk Prem. = standard deviation of fund's risk-premium; Std. Dev. Neg. Risk Prem. = standard deviation of fund's

negative risk-premium; Average Risk Premium = this is the average risk premium obtained by the fund during the sample period; Sharpe Index = this is the Sharpe index (Sharpe, 1966) considering the adjustment presented by Israelsen (2005); Sortino Index = this is the Sortino index obtained during the sample period; (w) = denotes variables winsorized at 2.5%; Fund's size, represents the natural logarithm of average of monthly fund's TNA; Man-Fee indicates the maximum value of management fees that each fund can charge yearly, in % of TNA; Perf-Fee represents a dummy variable that receives 1 for funds with performance fees and 0 for the other cases; Large Family is a dummy variable which receives 1 for funds from the nine larger fund families in the sample, and 0 for the other cases; Big Four is a dummy variable which receives 1 for funds audited by Deloitte, EY, KPMG or PwC (alphabetical order), and 0 for the other cases; Deloitte, EY, KPMG and PwC are dummy variables, and each one receives the value 1 for funds audited by the respective auditing firm, and 0 for the other cases; Big Four * Large Family, this is a variable that indicates funds audited by Big Four firms and also belongs to a large family.

These findings may be related with the arguments of Krishnamurthy, Zhou and Zhou (2006) about the influence of audit firms' reputation on the perceived audit quality, assuming that investment funds demand high-quality audits, because of the complexity of their natural operations. This assumption would explain why funds of this study hired, dominantly, Big Four companies.

Nevertheless, even with this high index of Big Four participation in the sample, Table 3 indicates that none of the large families hired a non Big Four audit firm in the period. Using a chi-square test of association, this difference in frequencies is statistically significant (qui-square statistic = 157.58; sig. = 0.000). Still based on the descriptive statistics, there is a strong concentration in the funds of the sample, since nine fund families share more than a half of the resources managed in the sample period.

TABLE 3 - Number of Fund's from large families and the number of funds audited by a Big Four auditing firm

Fund Families	**Big Four**			**Big Four**		
	yes	**no**	**Total**	**yes**	**no**	**Total**
Large Fund Families	3,017	0	3,017	100.0%	0.0%	100%
Other Fund Families	7,491	397	7,888	95.0%	5.0%	100%
nº of observations	10,508	397	10,905	96.4%	3.6%	100%

Source: research data.

Notes: Pearson Chi-Square = 157.58 (sig.: 0.000).

4.2 Hypotheses testing

The results of the regressions indicated lower volatility in fund's returns for those funds audited by Big Four firms, and for funds of the nine largest families, as Table 4 indicates.

The negative effect of funds audited by Big Four firms and for funds of the nine largest families on fund's volatility was persistent among the three proxies for risk: standard deviation of fund's monthly returns; standard deviation of fund's risk-premium; standard deviation of fund's negative risk-premium. These findings suggest that low risk may also be understood as an additional element among the benefits of Big 4 audit firms, as explored in previous studies, such as earning management practices mitigation (VAN TENDELOO; VANSTRAELEN, 2008; ALMEIDA; ALMEIDA, 2009), high sale proceeds (DE FRANCO *et al*., 2011); less reporting errors (GEIGER; RAMA, 2006), among others. Moreover, the standards about accounting of financial instruments, which also are related with risk management, have been improved in the last years; therefore, better practices could be implemented due to training (NADIA; ROSA, 2014) on these standards of external auditors from the Big Four firms. This could be a reason for why funds audited by Big Four firms present lower levels of risk.

TABLE 4 - Effect of independent variables on fund's risk

Variables	Std. Dev. Ret. (w)		Std. Dev. Risk Prem. (w)		Std. Dev. Neg. Risk Prem. (w)	
	Mod-1	Mod-2	Mod-1	Mod-2	Mod-1	Mod-2
Fund's Size	-0.127 ***	-0.130 ***	-0.039 ***	-0.043 ***	-0.040 ***	-0.044 ***
Adm-Fee	0.018	0.016	0.051 ***	0.049 ***	0.028 ***	0.026 ***
Perf-Fee	-0.372 ***	-0.341 ***	-0.181 ***	-0.154 ***	-0.148 ***	-0.127 ***
Large Family	-0.299 ***	***	-0.232 ***		-0.157 ***	
Big Four	-1.412 ***	***	-0.555 ***		-0.258 ***	
BigFour-1		-1.425 ***		-0.585 ***		-0.290 ***
BigFour-2		-1.052 ***		-0.376 ***		-0.187 ***
BigFour-3		-1.514 ***		-0.614 ***		-0.285 ***
BigFour-4		-1.500 ***		-0.672 ***		-0.337 ***
Constant	9.303 ***	9.295 ***	6.083 ***	6.119 ***	3.444 ***	3.493 ***

Source: research data.

Notes: Fund's size, represents the natural logarithm of average of monthly fund's TNA; Man-Fee indicates the maximum value of management fees that each fund can charge yearly, in % of TNA; Perf-Fee represents a dummy variable that receives 1 for funds with performance fees and 0 for the other cases; Large Family is a dummy variable which receives 1 for funds from the nine larger fund families in the sample, and 0 for the other cases; Big Four is a dummy variable which receives 1 for funds audited by Deloitte, EY, KPMG or PwC (alphabetical order), and 0 for the other cases; BigFour-1, BigFour-2, BigFour-3 and BigFour-4 represent dummy variables for one of the Big Four auditing firms (Deloitte, EY, KPMG and PwC, not necessarily in this order), and they receive the value 1 for funds audited by the respective auditing firm, and 0 for the other cases; Big Four * Large Family, this is a variable that indicates funds audited by Big Four firms and also belongs to a large family; all the models in this table includes dummy variables for fund's classes (three classes, as described in the methods section) and robust standard errors. *** significant at 1%; ** significant at 5%; * significant at 10%.

TABLE 5 - Effect of independent variables on fund's performance

Variables	Average Risk Premium (w)		Sharpe Index (w)		Sortino Index (w)	
	Mod-1	Mod-2	Mod-1	Mod-2	Mod-1	Mod-2
Fund's Size	0.035 ***	0.036 ***	0.057 ***	0.060 ***	0.108 ***	0.106 ***
Adm-Fee	-0.005	-0.005	-0.019 *	-0.021 *	-0.208 ***	-0.211 ***
Perf-Fee	0.071 ***	0.070 ***	0.152 ***	0.143 ***	0.370 ***	0.382 ***
Large Family	0.003		0.071 ***		-0.109 ***	
Big Four	0.095 **		0.417 ***		0.230 ***	
BigFour-1		0.083 **		0.422 ***		0.217 **
BigFour-2		0.134 ***		0.368 ***		0.228 **
BigFour-3		0.069 *		0.370 ***		0.179 **
BigFour-4		0.099 **		0.482 ***		0.143
Constant	0.252 ***	0.245 ***	-1.495 ***	-1.508 ***	-1.432 ***	-1.395 ***

Source: research data.

Notes: Fund's size, represents the natural logarithm of average of monthly fund's TNA; Man-Fee indicates the maximum value of management fees that each fund can charge yearly, in % of TNA; Perf-Fee represents a dummy variable that receives 1 for funds with performance fees and 0 for the other cases; Large Family is a dummy variable which receives 1 for funds from the nine larger fund families in the sample, and 0 for the other

cases; Big Four is a dummy variable which receives 1 for funds audited by Deloitte, EY, KPMG or PwC (alphabetical order), and 0 for the other cases; BigFour-1, BigFour-2, BigFour-3 and BigFour-4 represent dummy variables for one of the Big Four auditing firms (Deloitte, EY, KPMG and PwC, not necessarily in this order), and they receive the value 1 for funds audited by the respective auditing firm, and 0 for the other cases; Big Four * Large Family, this is a variable that indicates funds audited by Big Four firms and also belongs to a large family; all the models in this table includes dummy variables for fund's classes (three classes, as described in the methods section) and robust standard errors. *** significant at 1%; ** significant at 5%; * significant at 10%.

Strong audit processes can also contribute to corporate governance (CARCELLO *et al*., 2002), benefitting the internal management of investment funds, and this statement is in line with the empirical results found in this paper. Regarding funds' characteristics, the results suggest that large funds and funds that charge performance fees tend to be willing of assuming lower levels of risk.

Moreover, when observing the effect of Big Four audit on funds' performance (Table 5), sufficient evidences of better performance provided by Big Four firms have also been found. This evidence is equivalent among the three proxies for performance: the Sharpe index; the Sortino index; and the average risk-premium in the period. Therefore, the results of this study are in line with the findings of Chou, Zaiats and Zhang (2014), which verified that firms audited Big Four outperform the ones audited by non-Big Four. As regards the funds' characteristics, large funds presented better performance, as well as those funds that have performance fees. When comparing Tables 4 and 5, we can understand that those funds, which assume lower levels of risk, also tend to present better levels of performance.

These results confirm the first hypothesis of this study, since funds audited by Big Four firms present lower levels of risk and better indexes of performance. Regarding the second hypothesis, not necessarily being an investment fund linked to a large fund family is a factor that contributes to fund's risk-adjusted returns, but funds from large families present lower levels of volatility. All the investment funds from large fund families in the sample hire Big Four audit firms, as presented in Table 2. Therefore, the interaction effect proposed in the third hypothesis has the same effect of the variable "Large Family". The descriptive statistic, available in Table 3, confirms this assertion, since the average of the variable "Large Family" (0.227) is the same value of the average in variable "Big Four * Large Family".

4.3 Robustness Checking

We repeated all the analysis available in Tables 4 and 5 considering in the sample only funds with complete returns for the sample period. The number of funds, in this second round of analysis, was reduced from 10,905 to 9,629. The results for the hypotheses testing were the same, since the coefficient for the Big Four audit firms and for Large Families presented the same sign and significance level, when compared with those obtained in Tables 4 and 5 (even for the inconclusive effect of families' size on funds' performance). This new analysis indicate that the effect documented in this study is not subject to survival bias.

5. Conclusion

The aim of this study was to analyze the effect of being audited by a Big Four audit company on fund's risk and fund's performance. This paper considers a large sample, which represents more than 70% of the industry of investment funds in Brazil. This sample also includes three classes of investment funds: equity mutual funds, multimarket funds, and fixed income funds. Using variables related with audit quality and with the size of fund families, we find robust evidences about the benefits of audit quality in the context of entities that use financial instruments to develop their daily activities. Funds audited by Big Four audit firms presented lower levels of risk and better measures of performance, including risk-adjusted returns.

The results presented in this paper contribute to the literature on the accounting by showing the benefits provided by Big Four audit firms in the context of institutional investors. Specifically, this study empirically indicates that Big Four audits are associated with low volatility in fund's returns and fund's risk premium. These findings have special implications for fund managers on their choice of auditors, as well as for those investors who present higher levels of risk-aversion in the financial market. Those variables related with lower levels of risk were also the variables related with better levels of fund's performance.

The results obtained in this paper also have implications to the literature that consider the positive relationship between audit quality and mechanisms of corporate governance. Strong practices of corporate governance and internal controls benefits fund managers, and their effects are also extensive to funds' shareholders, since they obtain better indexes of performance. For future research, we suggest an analysis considering the value of audit fees and its potential relationship with fund's risk and fund's risk-adjusted returns.

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