

Full Length Research Paper

Effect of European audit firms on cost of debt and earnings management in private clients' audit market segment

Stefano Azzali^{1*} and Tatiana Mazza²

¹Department of Economics and Management, University of Parma, Italy.

²Faculty of Economics and Management, University of Bozen, Italy.

Received 19 January, 2018; Accepted 23 March, 2018

This research studies the relation between audit firm choice and benefits that companies could gain in terms of lower cost of debt and earnings management. It focuses on private clients and the non-Big4 audit market segment, where the main driver of auditor choice has not to date been satisfactorily identified. This study identifies and tests a new criterion for auditor choice in private firms based on audit market boundaries (European vs. Domestic audit firms). Using a propensity score matched sample of private companies audited by non-Big4 audit firms in the period 2010 to 2014; this research finds that the choice of a European audit firm is negatively associated with cost of debt and earnings management. Private firms that choose audit firms operating at European level, as consequence, have lower cost of debt and earnings management, mitigate the agency conflicts between lenders and owner/manager, and improve their corporate governance mechanisms.

Key words: Audit firm choice, non-Big4, cost of debt, earnings management, private firms.

INTRODUCTION

The non-Big4 private clients' audit market segment is an interesting topic: the Green paper (European Commission, 2010) for example, is against the concentration of audit market and aims to favor the development of non-Big4 audit firms:

"The Commission recognizes that continuity in the provision of audit services to large companies is critical to financial stability. To this extent, options such as the ramping up of the capacities of non-systemic firms and

exploring the pros and cons of "downsizing" or "restructuring" systemic firms should be further examined. The Commission would also like to explore the possibilities to reduce existing barriers to entry into the audit market, including a debate on existing ownership rules and the partnership model employed by most audit firms."

The aim of this study is to explore the benefits in term of cost of debt and earning management of a new criterion

*Corresponding author. E-mail: stefano.azzali@unipr.it.

(European audit firm vs. Domestic audit firm) to choose the auditors in private clients' audit market segment.

This research contributes to the literature identifying an original audit firm choice criterion that, coherently with the framework of DeFond and Zhang (2014), suggest useful instruments for the evaluation of audit quality from the point of view of auditor supply, using auditor competences, reputation, and litigation risk. Given the gap in the previous literature that show that the current criterium to choose an auditor based on size is not sufficient among non-Big4, this study suggests a criterion based on the European boundaries of the audit market, showing its effectiveness in the reduction of CoD and EM, as an opportunity for clients to mitigate the agency conflict between lenders and managers in private firms through the choice of an EAF. The higher audit quality offered by EAF reduces risks related to earnings management and allows lenders to accept lower level of interests with benefits for all stakeholders.

Audit firm choice is a significant decision that may affect agency conflicts. Literature has widely analyzed the effects of audit firm choice, finding several benefits associated with Big4, such as lower Cost of Debt (CoD), Earnings Management (EM) and agency costs. These benefits are usually connected with high reputation auditors that reduce the litigation risks. However, these results are mainly related to Big4 of public clients, while for private firms and non-Big4 segment findings are mixed and it is an empirical question, which are effective criteria for the selection of audit firms. In countries with competitive audit market of private firms, effective audit firm choice criteria among non-Big4 have not been clearly identified yet.

Literature also analyzes and finds mixed results about difference between second-tier and third-tier, classifying audit firms based on market share as defined by Public Company Accounting Oversight Board (PCAOB). However, in U.S. they are analyzed under the same regulations, reputation and litigation environment while in Europe the new classification here introduced is based on different environments for audit firms.

This research tests the effects on CoD and EM of the choice of European audit firms (EAF) instead of domestic audit firms (DAF). In private firms, CoD is one of the most important drivers of managers' choices, given that debt is usually a significant financial resource and that the main agency conflict is between lenders and managers/owners. On the other hand, agency conflict between lenders and owners/management can also create EM incentives (Watts and Zimmerman, 1986; Li, 2017).

Italy is an interesting setting to investigate because: a) the non-BigN audit market share is significant in the private company segment (around 40%); b) auditors are liable to third parties (Giudici, 2012).¹ Investigating agency conflict between lenders and owners/manager is important because lenders care about audit quality and

have the power to sue auditors. Competitive audit markets with auditor liability towards third parties occur also in Sweden, Belgium, Denmark and Finland, and are analyzed in the robustness test. In all these countries, creditors can sue auditors, and the non-BigN market share in private firms is respectively 18, 54, 70 and 55%. O'Sullivan (1993) discusses the extension of liability to third party in the United Kingdom. Anantharaman et al. (2016) explore the extent to which auditors can be held liable by third parties for negligence and find that auditors are more likely to issue a modified going-concern report to financially distressed clients from high-liability states than to those from low-liability states.

Considering the endogeneity issue in the research about auditor choice, raised for example, by DeFond and Zhang (2014), this study uses a propensity-score matched sample of Italian companies audited by non-Big4 in the period 2010-2014. As expected, clients of EAF are associated with lower CoD and lower EM than clients of DAF. A battery of robustness tests run on alternative measures of CoD, EM, PSM, size, accounting standards, other countries with high third-party liability confirm our main results.

LITERATURE REVIEW

Literature review is based on the framework of DeFond and Zhang (2014) and we develop our hypothesis in the big picture of audit quality demand, supply and regulatory intervention.

Demand for audit quality

Clients have incentive to increase audit quality in order to lower agency costs. Literature on agency conflict in private firms finds that as the demand for financial reporting and for external audits mainly arises from the need for debt contracting with banks and other private lenders (Lennox, 2005), principals are typically lenders (Peek et al., 2010; Power, 1997; Vander Bauwhede and Willekens, 2004). A bank may place more trust in client financial reporting and reduce the CoD when a high quality auditor assures it. Previous old studies (Kelly and Mohrweis, 1989; Libby, 1979a, b; Strawser, 1994) as well as recently studies (Baylis et al., 2017; Robin et al., 2017; Chen et al., 2016) show that banks tend to form different perceptions according to the level of audit firm quality. Unlike public companies where internal corporate governance mechanism or surveillance of market authorities may mitigate agency costs, in private firms, audit quality may be the only available instrument to mitigate them (Cano-Rodríguez and Alegría, 2012). Moreover, Gul et al. (2013), analyzing data from several countries in the period 1994 to 2006, find that Big4 choice is related to lower CoD only in countries with stronger

(3) Clients have incentives to increase audit quality to reduce agency costs DEMAND FOR AUDIT QUALITY	(4) Cost of Debt	AUDIT QUALITY	(2) Auditor choice based on European audit firm vs Domestic audit firms	(1) Audit firms have incentives to increase audit quality for the reduction of reputation and litigation risks SUPPLY OF AUDIT QUALITY
	(4) Earnings Management			
Regulatory Intervention				

Figure 1. The association between auditor choice and agency theory in private firms and the non-Big4 segment.

Note:

- 1) Auditors have incentives to increase audit quality to reduce reputation and litigation risk.
- 2) Given that audit firm size, among non-Big4 segment, is not effective, we suggest a new audit firm choice criterion (European audit firm vs Domestic audit firms).
- 3) Clients have incentives to increase audit quality to reduce agency costs and agency conflicts between lenders and manager.
- 4) We expect that European audit firm, through higher audit quality, is associated with lower cost of debt, earnings management and agency costs.

Source: Adapted from DeFond and Zhang (2014).

investor protection.

Agency conflicts between lenders and owners/management can also create EM incentive, enhanced in the case of earnings-based debt covenants (Watts and Zimmerman, 1986; DeFond and Jiambalvo, 1994; Sweeney, 1994; Dichev and Skinner, 2002; Gao et al., 2017; Li, 2016). Note also that, especially after the Basel accords, the stability of the banking and financial system has been found to critically depend on client financial reporting transparency (Bushman and Landsman, 2010), making earnings an attribute of crucial importance. Vander Bauwhede et al. (2003) show that in Belgium, BigN constrain EM more than non-BigN only when the company manages earnings opportunistically to have earnings above the benchmark target of prior-year earnings, or where there is incentive to smooth earnings downwards. In other circumstances, BigN do not place any more constraint on EM than non-BigN. Vander Bauwhede and Willekens (2004) use different proxies to measure audit size (auditor market share, number of audit firm clients, number of partners in the audit firm, total assets and operating profit of the audit firm) and again find no significant reduction of EM in Belgian private companies when the audit firm is a BigN firm. Van Tendeloo and Vanstraelen (2008) examine the impact of audit quality on earnings quality in private firms in six European countries. They argue that in countries with a close alignment between tax accounting and financial reporting, financial statements are scrutinized more closely by the tax authorities, which makes the detection of audit failure more likely. They find that Big4 auditors constrain EM more than non-Big4 auditors in private

firms, but only in countries with a high tax alignment (Belgium, Finland, France and Spain) compared to low tax alignment countries (The Netherlands, UK). They also categorize non-Big4 auditors into Second-tier and small auditors, but find no indication that the Second-tier auditors constrain EM more than small auditors.

The research proxies the agency costs with CoD and EM and tests how they are affected by auditor choice in private firms and in the non-Big4 audit market segment.ⁱⁱ Figure 1 show how the demand for audit quality is investigated through CoD and EM and how it is related to the supply of audit quality from EAF vs DAF.

Supply of audit quality

Among the several factors that affect audit quality, the paper focuses on auditor choice criteria among non-Big4 in private firms. These criteria are usually based on audit firm size, auditors reputation and litigation risks.

Previous literature typically compares BigN and non-BigN and, in public firms, find several benefits associated with BigN and their public clients. BigN provide higher-quality audits in order to protect brand name reputation from legal exposure (DeAngelo, 1981; Francis and Wilson, 1988; Simunic and Stein, 1987; Firth, 1999; Lennox, 1999; Tomczyk, 1996). Some of benefits gained when audited by a Big4 are lower CoD (Gul et al., 2013; Pittman and Fortin, 2004; Mansi et al., 2004; Causholli and Knechel, 2012) and higher EQ (Becker et al., 1998; Francis et al., 1999a; Teoh and Wong, 1993; Nelson et al., 2002; Kim et al., 2003; Gaver and Paterson, 2001;

Gerayli et al., 2011; Francis et al., 2009; Tsipouridou and Spathis, 2012; Porte et al., 2015). Specifically, DeAngelo (1981) agency-based framework suggests that large audit firms with large numbers of clients entail higher reputation costs as collateral against poor-quality audits. Large clients, particularly those with multinational operations, demand consistent auditing throughout the world, for example from a global audit firm network (Carson, 2009): he argues that global audit firm networks have competitive advantages not available to domestic audit firms. These advantages include knowledge of diverse business practices, an ability to operate across multiple business environments, expertise developed from servicing similar clients in different locations, robust and efficient audit methodology and processes, knowledgeable and expert professional staff, the ability to develop specific industry training and protocols as competences, and superior brand image as well as reputation. Competitive advantages attract clients seeking higher quality audits.

Firm size advantages have been studied also outside auditing. Larger firms interact with a greater number and variety of stakeholders, which would influence the complexity and multidimensionality of any formalized policy (Hart and Sharma, 2004). Larger firms presumably have more resources in the form of human and financial capital (Gallo and Christensen, 2011). Due to functional differentiation, specialization, and decentralization (Damanpour, 1987; Moch, 1976) larger firms have more specialized staff, more evolved administrative processes, and have more sophisticated internal systems to deal with business issues (Damanpour, 1996; Baumann-Pauly et al., 2013). Moreover, taking the perspective of legitimacy theory, some earlier studies were inspired by the argument that firms may increase the quality to hedge reputational risks and to prevent or to react to attacks from powerful stakeholder groups, such as customer pressure groups, and the media (Bansal and Clelland, 2004; Chatterji and Toffel, 2010; Schreck and Raithel, 2015).

The literature also analyzes Second-tier and/or Third-tier audit firms, based on market share as defined by Public Company Accounting Oversight Board (PCAOB), but finds mixed results, especially in private firms: for example, prior research (Chang et al., 2010; Cassell et al., 2013; Wang and Fan, 2014; Jenkins and Velury, 2011; Weber and Willenborg, 2003) finds a significantly higher audit quality for Second-tier while others do not (Van Tendeloo and Vanstraelen, 2008; Geiger and Rama, 2006).

Previous literature in short shows that size is a significant audit firm choice criterion in public companies. However, in private firms and the non-Big4 segment, it appears to be not sufficient (Lawrence et al., 2011) to differentiate the capacity of audit firms to reduce the agency conflicts. This capacity implies greater resources to invest in training professionals to detect errors.

Moreover, auditor size is sensitive to macro-economic effect (Fleischer and Goettsche, 2012). Hodgdon and Hughes (2016) also discuss the dishomogeneity of disclosure quality when audited by one Big4 versus the other Big4. Empirical research is required to identify criteria used by private firms in choosing audit firm, among non-Big4.

Hypothesis development

Non-Big4 has a significant audit market share in Italy (nearly 40%) and in several other European countries (e.g. Belgium, Denmark and Finland) in private firms. The research looks for a new audit firm choice criterion that assure the same benefits in terms of lower CoD and EM that previous literature found in public clients audited by Big4. Following previous literature, it developed our new criterion based on reputation, competences and litigation risks. Finally, it includes this criterion in the category of supply in the framework of DeFond and Zhang (2014).

The research analyzes the boundaries of the audit market addressed by non-Big4. Given that European Union Directives (European Parliament, 1984, 2006a) allow audit firms to operate in all member countries, it develops our hypothesis suggesting the classification of audit firms into two groups: 1) European Audit Firms (EAF) that work at European level and 2) Domestic Audit Firms (DAF) that work only in Italy.

The paper investigates differences in the quality of audit firms with clients located in European Union (EAF) and Domestic audit firms with clients located only in one country (DAF). EAF can be viewed as an extension of DeAngelo (1981) arguments where the creation of EAF with high competences and reputation is one way to manage the provision of high-quality audit services to clients. These advantages can be the same for different EAF but may not be available for DAF. The capacity to satisfy clients operating at European level requires legal, fiscal, social and environmental expertise of the country of operation. Demartini and Trucco (2016) have shown how auditor's experience is perceived important from surveys to partners. EAF, moreover are facing additional mandatory competence requirements. A domestic audit firm wishing to perform an audit in another European Union country needs to have a partner, which has passed an aptitude knowledge test of the legislation of that countryⁱⁱⁱ. Thus, the research expects that the choice of hiring an EAF with more competences and reputation than a DAF is associated with lower CoD and EM.

Higher expected quality from EAF is also a result of stricter audit environment stemming from the higher enforcement and litigation risk present in different European countries, given that firms enter in the audit environment of each state where they want to operate. Audit firms that operate in more than one country have to adapt to different enforcement regulations. A stricter audit environment and more enforcement regulations promote

audit quality. Maijor and Vanstraelen (2006) find that a stricter audit environment in a European member state lowers EM compared to other member states. Van Buuren et al. (2014) find that enforcement by audit supervisory authorities is one of the important factors explaining the use of business risk perspectives. Willekens and Simunic (2007) study the joint liability between directors and auditors and the relation on audit effort. Kleinman et al. (2014) argue that it is important to investigate the auditing regulatory regimes in different nations around the world, as well as the nature of cross-border audit inspections and their effect on AQ. There are different auditor liability regimes in the EU, such as the capped versus uncapped liability regimes, and this different litigation risk has a different potential effect on audit quality (EC DG, 2006).

The counterargument is that DAF are more specialized in the country where they operate. Following Francis et al. (1999b) and Ferguson et al. (2003), Francis and Yu (2009) argue that accounting professionals are typically based in specific practice offices and audit clients in the same geographic location. This decentralization reduces information asymmetry and enables auditors to develop better knowledge of existing and potential clients in a particular location. Clients, in turn, have greater knowledge of and confidence in the expertise of locally based personnel who actually perform audits (Carcello et al., 1992). The same argument could be made for DAF: through the specialization in one country they may have better knowledge in a particular location. Moreover, Vera-Muñoz et al. (2006) point out that firm-wide knowledge sharing has practical limitations, and for this reason, it is an open empirical question as to what extent these firm-wide mechanisms can effectively increase the hypothesized European effect.

The paper developed our hypothesis in private clients and non-Big4 audit firms. The effect of auditor choice is largely unknown for non-Big4. Competence acquired in operating at European level could have higher marginal value. In the U.S., non-Big4 have been mainly analyzed dividing them into Second-tier and Third-tier audit firms, or into international – national – local audit firms (Beattie and Fearnley, 1995). It introduces the category of EAF (similar to national level) and DAF (similar to local level). The main difference between local and national audit firms in U.S. is related to the number of clients. However, local and national audit firms in the U.S. are under the same regulations and therefore the same reputation and litigation environment. In Europe, the environment is different for EAF and DAF and the paper contributes to the literature testing this audit firm choice criterion. Given previous literature results on reputation, competences and litigation risk, we decide to develop the analysis in the form of a directional hypothesis, with two multivariate regression models respectively for CoD and earnings management:

Hp1: Private clients of European Audit Firms have lower

Cost of Debt and lower Earnings Management than private clients of Domestic Audit Firms

METHODOLOGY

Here presents the sample selection, the audit firms classification and the data collection strategies to identify EAF and DAF; the statistical regression models for CoD and earnings management used to test the hypothesis as well as the propensity score matching model to solve the problem of endogeneity. Prior literature found specific determinants for CoD (quick ratio, ROA, tangible, negative equity, loan maturity) and for earnings management (loss, sales growth, cash flow from operation and its variability), thus we decided to use different regression models.

Sample selection

The sample includes all 1149 Italian companies audited by non-Big4 audit firms (firms with two or more individual owners) with more than one client per year, appearing in Bureau Van Dijk database (Table 1).

We firstly drop public companies because they cannot choose among the different types of audit firms here analyzed, leaving a sample of 895 firms.^{iv} The number of firm-year observations for the period 2010 - 2014 for these is 4435. In the period analyzed in this research (2010 - 2014), Italian auditors used national auditing standards. These standards are similar to International Standards of Audit (ISA), and meanwhile Italy is moving towards their implementation^v. This database includes only the name of the last audit firm engaged and the year of its engagement. Two downloads, one in 2012 and one in 2014, thus supplied the name of the firm that audited the list of clients in our sample at the end of 2012 and at the end of 2014. For each of the audit firms we have the starting year of the engagement. We include only the years for which we know that the audit firm was auditing a specific client, resulting in a sample period different for each firm (unbalanced sample). All the firms in our sample voluntarily choose an external audit firm^{vi}. The problem of self-selection of the sample is lower than in prior studies because the comparison is not with firms that do not undergo audit, but between the types of audit firm that they engage. All the firms in the sample undergo audit.

Secondly, we compute the CoD and we drop observations with missing values for this variable. The final sample used in the logistic regression of the auditor choice model consists of 1798 observations. PSM yields a sample of 1206 observations to be used in the main analysis (Panel A, Table 1).

Thirdly, we compute abnormal accruals and we drop observations with missing values for this variable. The final sample used in the logistic regression of the auditor choice model consists of 1162 observations. PSM yields a sample of 950 observations to be used in the main analysis (Panel B, Table 1).

The industry composition^{vii} of our sample of private firms reflects the industry composition of firms in Italy, with a higher percentage of professional, technical and scientific services, construction activities, wholesale and retail trading; transport and storing activities; lodging and catering services; real estate; hiring services and travel agencies. Other industries represented are manufacturing, electric energy and gas supply; water supply and garbage disposal activities; information and communications. Percentages are lower for entertainment and sport activities; other services, agriculture, forestry and fishing; and minerals extraction (untabulated).

Audit firms classification

Most of the U.S. literature (Francis et al., 1999b; Weber and

Table 1. Sample selection.

Description	N
Total number of Italian companies audited by a non-Big4 audit firm with at least 2 clients in the Bureau Van Dijck database in 2014	1149
Less public companies or companies subjected to mandatory audit in 2014	-254
Total number of firms in the sample	895
Total number of observations for the period 2010-2014	4435
Panel A	
Starting from total number of observations for the period 2010 - 2014	4435
Less observations with missing values necessary to compute variables related to cost of debt	-2637
Total number of observations in the regression model for auditor choice in Cost of Debt analysis	1798
Less observations not matched in Propensity Score Matching model	-592
Total number of observations in the matched sample for Cost of Debt analysis	1206
Panel B	
Starting from total number of observations for the period 2010 - 2014	4435
Less observations with missing values necessary to compute variables related to abnormal accruals (observations lost mainly for lack of data on cash flows)	-3273
Total number of observations in the regression model for auditor choice in Earnings Management analysis	1162
Less observations not matched in Propensity Score Matching model	-212
Total number of observations in the matched sample for Earnings Management analysis	950

Table 2. Non-Big4 Audit firm classification.

Category	No. of audit firm	Client market share based on client total assets (%)
European audit firm	20	74.3
Domestic audit firm	70	25.7
Non-Big4	90	100.00

Willenborg, 2003; Geiger and Rama, 2006) analyzes audit firms that operate at international level (BigN), at national level (within U.S.) and local/regional level (within individual U.S. State). The three levels are even more important in markets characterized by a lower presence of BigN (Read et al., 2004), like the private company market. Similarly, in the European Union, excluding Big4 that operate at international level, we analyze EAF in the same way as audit firms operating at national level (within Europe) and DAF in the same way as audit firms that operate at local/regional level (within individual European State). To classify audit firms as EAF or DAF and to see if they are allowed to operate at European level, we check the presence of audit firms belonging to the same network in the registers of the following European countries: France, UK, Ireland, Belgium, Netherland, and Luxembourg.^{viii} We checked premises and offices on their websites, to ensure that they actually

operate there. We thus defined our sample of audit firms on the basis of the number of clients in more than one country (reputation and litigation risk) and on qualification requirements (competences) required for auditing in the countries selected. Table 2 shows the number of EAF, and names are shown in Appendix A.

Multivariate regressions models

Our model tests the effect of EAF on CoD and EM in private firms.

The Cost of Debt (CoD) model

The CoD model is the following Equation (1):

$$CoD_{it} = \alpha + \beta_1 EAF + \beta_2 SIZE_{it} + \beta_3 LEVERAGE_{it} + \beta_4 QUICK_{it} + \beta_5 ROA_{it} + \beta_6 TANGIBLE_{it} + \beta_7 ALTMAN_{it} + \beta_8 NEGATIVE EQUITY_{it} + \beta_9 LOAN MATURITY_{it} + \beta_{10} OWNERSHIP CONCENTRATION_{it} + industry\ fixed\ effect + year\ fixed\ effect + e \quad (1)$$

CoD is the average cost of financial debts for firm i and year t , which is the financial cost disclosed in the income statement following Generally Accepted Accounting Principles (GAAP) in Italy, scaled by the total amount of financial debts. The financial cost includes interest and commission. Following Francis et al. (2005), Karjalainen (2011); Cano-Rodriguez and Alegria (2012); Gul et al. (2013), we choose a measure that includes only interest-bearing

debt. Li et al. (2010) support the use of CoD in analyzing the consequences of auditor choice for several reasons: the public debt market is significantly larger than the equity market in some contexts; CoD is relatively well defined with less mis-specification than cost of equity; CoD is not affected by the difference of more or less sophisticated investors given that the information environment in the debt market is characterized by numerous information

intermediaries.

EAF has value 1 for audit firms that operate in more than one country in Europe with only private clients in Italy, and 0 otherwise.

Independent control variables were selected on the basis of numerous prior studies on CoD (Kim et al., 2011; Aobdia et al., 2015; Chin et al., 2014; Petersen and Rajan, 1994; Bharath et al., 2008; Karjalainen, 2011; Graham et al., 2008; Lai, 2011; Pittman and Fortin, 2004). The literature on cross-sectional determinants of loan pricing, in general, finds that firm SIZE is inversely related to credit risk. Agency theory predicts that the risk of agency conflicts, such as risk shifting and underinvestment, between a firm's insider and outside lenders increases with financial leverage and leverage maturity structure. To control for this, we include LEVERAGE (Kim et al., 2011; Bharath et al., 2008; Graham et al., 2008; Aobdia et al., 2015; Karjalainen, 2011; Pittman and Fortin, 2004). QUICK or current ratios have been used in prior studies as a proxy of financial risk. Firms with a low value of this ratio may be suffering from liquidity problems, and they may be forced to use more expensive credit (Bharath et al., 2008; Aobdia et al., 2015). It is important to control for profitability through ROA; banks and other private lenders are likely to charge lower interest rates to firms that are more profitable because such firms are better able to service their debt (Kim et al., 2011; Graham et al., 2008; Aobdia et al., 2015). We include TANGIBLE in order to have a measure of asset composition as determinant of CoD. The loan pricing literature suggests that owning tangible assets is inversely related to credit risk, given that they can work as collateral and, thus, the interest rate that lenders charge (Bharath et al., 2008; Aobdia et al., 2015; Graham et al., 2008; Kim et al., 2011; Karjalainen, 2011; Pittman

$$DACC_{it} = \alpha + \beta_1 EAF + \beta_2 SIZE_{it} + \beta_3 LEVERAGE_{it} + \beta_4 LOSS_{it} + \beta_5 SALES\ GROWTH_{it} + \beta_6 SDCFO_{it} + \beta_7 CFO_{it} + \beta_8 ALTMAN_{it} + \beta_9 OWNERSHIP\ CONCENTRATION_{it} + industry\ fixed\ effect + year\ fixed\ effect + e \quad (2)$$

For discretionary accruals (DACC), we use a linear expectation model following Francis and Wang (2008). This method is preferred in research using a small sample because it does not require a minimum number of observations for each industry. This minimum number is required on the other hand by the cross-sectional Jones (1991) model and its later versions.

EAF is defined as before. Independent control variables are selected on the wide of prior numerous studies on EM (Francis and Wang, 2008). We control for SIZE, motivated by the political visibility hypothesis. This predicts that large firms will make income-decreasing accounting method choices in response to greater political/regulatory scrutiny or when motivated by other underlying constructs (e.g., information environment, capital market pressure, or financial resources) that predict a negative association between size and EM (Dechow et al., 2010). We control for LEVERAGE, because a higher total debt to asset ratio indicates a higher possibility of debt covenant violation, which creates an incentive to increase reported earnings through accruals-based earnings management (e.g., Francis and Wang, 2008; Dechow et al., 2010; DeFond and Jiambalvo, 1994; Francis and Yu, 2009). We control for LOSS given that the evidence that weak performance provides incentives for EM is well-established (Dechow et al., 2010). We control for GROWTH given that it can affect yearly accruals if the relation between accruals and the accruals drivers (sales and gross PPE) is nonlinear (e.g., Francis and Wang, 2008). To have a well specified model, it has been shown that it is important to control for CFO because they vary inversely to discretionary accruals (Dechow et al., 1995) and for their STANDARD DEVIATION. Standard deviation is considered a relatively nondiscretionary driver of accrual variance in resolving problems arising because measures of absolute discretionary accruals are a function of the dispersion in signed discretionary accruals (Hribar and Nichols, 2007). To control for financial distress we include the firm's probability of bankruptcy,

and Fortin, 2004). We include the ALTMAN score of bankruptcy because debt holders may demand higher interest to cover this higher risk (Lai, 2011; Bharath et al., 2008; Graham et al., 2008; Aobdia et al., 2015). Lower values indicate more financial distress, so that a negative association is expected with accrual. Because about 2.8% of private Italian companies in our sample experienced negative equity during the sample period, we include the NEGATIVE EQUITY dummy variable as an additional control for credit risk. Firms with negative equity are more risky financially, and the debt holder may charge them higher interest as compensation (Kim et al., 2011; Karjalainen, 2011; Pittman and Fortin, 2004). We include LOAN MATURITY because the lender requires a liquidity premium for longer-term debt and this liquidity premium translates into a higher loan spread (Bharath et al., 2008; Aobdia et al., 2015; Graham et al., 2008; Lai, 2011; Karjalainen, 2011).^{ix} Because agency conflicts between concentrated ownership and minority shareholders are a frequent problem in Italy, we control also for the OWNERSHIP STRUCTURE. The Italian capital market consists of a relatively large proportion of firms that have concentrated ownership (La Porta et al., 1999; Lins et al., 2013; Gomez-Meija and Nunez-Nickel, 2001; Schulze et al., 2001; Blanco-Mazagatos et al., 2007; Prencipe et al., 2011)^x The higher the percentage of total shares held by the largest owner, the less likely a high-quality auditor will be chosen (Lin and Liu, 2009).

The Earnings Management (EM) model

The EM model is the following Equation (2):

estimated using ALTMAN'S score. Lower values indicate more financial distress, so that a negative association is expected with accrual. This is because financially distressed companies have higher incentive to use accruals to increase earnings to avoid revealing problems and possibly affect prices (Reynolds and Francis, 2000; Francis and Yu, 2009). Given the nature of the Italian market, we control also for the OWNERSHIP STRUCTURE.

Propensity-Score matching model

To consider the endogeneity issue, we use propensity-score matching models, developed by Rosenbaum and Rubin (1983), to match a range of client characteristics to examine whether the auditor distinction can be attributed to specific client characteristics^{xi}. Propensity-score matching models match observations based on the probability of undergoing a treatment, which in our case is the probability of selecting an EAF. We use logit models, the most frequent approach (Guo and Fraser, 2010)^{xii}. We replace a DAF audit client with an EAF audit client that has the closest predicted value from the following Equation 3, within a maximum distance of 1%^{xiii}.

$$EAF = \alpha + \beta_1 SIZE_{it} + \beta_2 LEVERAGE_{it} + \beta_3 LOSS_{it} + \beta_4 ASSET_TURNOVER_{it} + \beta_5 QUICK_{it} + \beta_6 SIZE\ SQUARE_{it} + industry\ fixed\ effect + year\ fixed\ effect + e \quad (3)$$

Definitions of variables are shown in Appendix A. Independent variables are chosen on the basis of studies on audit firm choice.^{xiv}

We next compute the goodness of the propensity score match using a Bias measure.^{xv} Estimating Equations 1 and 2 we test the multivariate effect on CoD and EQ in the common support sample

Table 3. Descriptive statistics.

Panel A: Cost of debt analysis	Full sample (N=1206)					DAF (N=603)	EAF (N=603)
	Mean	SD	25th p.	Median	75th p.	Mean	Mean
Dependent variables							
CoD	0.072	0.086	0.034	0.048	0.074	0.077*	0.067
Independent control variables							
Size (Total Assets in Millions)	53.213	113.945	9.745	25.742	58.251	51.254	55.172
Leverage	0.677	0.228	0.529	0.725	0.849	0.672	0.682
Loss	0.297	0.457	0.000	0.000	1.000	0.300	0.294
Asset Turnover	1.075	1.062	0.343	0.858	1.419	1.056	1.095
Quick	1.120	1.226	0.558	0.865	1.216	1.125	1.115
ROA	0.018	0.080	-0.005	0.019	0.045	0.017	0.018
Tangible	0.253	0.260	0.028	0.173	0.384	0.272**	0.234
Altman	1.537	1.640	0.712	1.300	1.990	1.476*	1.599
Negative Equity	0.028	0.166	0.000	0.000	0.000	0.020	0.036
Loan Maturity	0.789	0.242	0.698	0.865	0.979	0.776*	0.801
Ownership Concentration	0.033	0.179	0.000	0.000	0.000	0.027	0.040
Panel B: Earnings management analysis							
Panel B: Earnings management analysis	Full sample (N=950)					DAF (N=475)	EAF (N=475)
	Mean	SD	25th p.	Median	75th p.	Mean	Mean
Dependent variables							
Abnormal Accruals - Francis and Wang (2008)	0.202	0.160	0.073	0.164	0.309	0.209	0.196
Independent control variables							
Size (total assets in millions)	48.940	129.399	7.180	21.679	49.980	43.485	54.395
Leverage	0.653	0.245	0.503	0.698	0.842	0.650	0.655
Loss	0.295	0.456	0.000	0.000	1.000	0.278	0.312
Asset turnover	1.060	0.937	0.395	0.879	1.470	1.073	1.048
Quick	1.756	4.161	0.643	0.966	1.454	1.826	1.686
Sales growth	-0.011	0.491	-0.097	-0.001	0.075	-0.021	-0.001
SDCFO	0.130	0.207	0.010	0.035	0.184	0.112***	0.149
CFO	0.042	0.097	0.013	0.037	0.074	0.040	0.045
Altman	1.971	4.502	0.725	1.403	2.252	1.946	1.997
Ownership concentration	0.065	0.247	0.000	0.000	0.000	0.055	0.076

*, **, *** is respectively 0.1, 0.05, 0.001 the p-value of the t-test of the difference in the mean between EAF and DAF. Variable definition in Appendix A.

when the weight is generated.^{xvi} All the Equations are estimated with industry and year fixed-effects, in order to control for systematic differences in audit firm choice, CoD and EQ across industries and years in the sample^{xvii}. For the sake of brevity, industry and year indicator variables are not reported in the tables.

Descriptive statistics and correlation matrix

Table 3 shows the descriptive statistics of CoD and its control variables in Panel A. It shows descriptive statistics of EM and its control variables in Panel B. The mean CoD for financial debts (7.2%) and for bank debts (untabulated) are similar. The mean CoD is consistent with literature (e.g. Minnis, 2011). The mean of abnormal accruals is 20% of total assets, higher than the usual mean of below 10% for public companies (Cameran et al., 2015).

The client size has a mean of about €53 million and €49 million euro respectively in Panel A and B, significantly lower than the

mean size of Italian public firms. The test for mean difference in the last four columns of Table 3 shows that client size is very similar for clients of DAF and EAF. This shows that our sample of private firms is balanced for each group. The financial leverage of the companies is relatively high, liabilities are between a minimum mean of 65% (Panel A) and a maximum mean of 68.9% (Panel B) of total assets in the full samples, which is consistent with our expectation that debt financing is important in privately held firms. The percentage of loss is about 30% in all non-Big4 clients showing a slightly lower performance of private clients that choose an audit firm with experience in auditing public clients. However, there are no significant differences between EAF and DAF. Asset turnover shows that revenues are higher in mean than total assets in all non-Big4 clients. In our sample, short-term assets are always higher in mean than short-term debts (quick ratio higher than 1) showing short-term financial equilibrium.

Other common variables between CoD and EM samples are the Altman score and ownership concentration. The Altman score

shows the level of the bankruptcy problem, which lies between 1.537 (Panel A) and 1.971 (Panel B), consistent with the literature (Reichelt and Wang, 2010). In ownership concentration, between 3.3% (Panel A) and 6.5% (Panel B) of companies one shareholder controls at least 75% of the company.

In the CoD sample, firms have a low profitability (ROA of about 1%) given that in the period analyzed companies had not recovered yet from the crisis. Our sample firms have a relatively low level of tangible assets (25.3% of total assets). On average, about 2.8% of private companies in our sample have negative equity during the sample period. This high percentage is also probably due to the lasting effects of the crisis. Finally, the loan maturity shows that short-term debts are 78.9% of long-term debts, with a higher percentage for EAF than for DAF clients. In Italy, there are more bank loans than financing from bonds and other forms than in U.S. Mansi et al. (2004) discuss that in the U.S., public debt securities represent a significant portion of the typical corporation's value.

In the EM sample, sales are always decreasing. The standard deviation and the value of cash flow from operations are 0.13 and 0.042 respectively, consistent with the literature (Reichelt and Wang, 2010).

The purpose of PSM is to identify very similar companies, with the sole difference being the auditor chosen, for the purpose of comparison. Descriptive statistics show that there are no statistically significant differences between EAF and DAF for the following variables: size, leverage, loss, asset turnover or quick ratio. This comes to the proper application of PSM. In the univariate test of mean difference for the CoD and EM variables, CoD is statistically significant lower in EAF than DAF.

The correlation matrix (Table 4) does not show substantial problems of multicollinearity. The mean variance inflation factor is under 4. The highest correlation between variables of the same regression is 36.4% between Altman and ROA, showing an acceptable level of correlation. The same is true of Panel B. The highest correlation between variables of the same regression is -38.7% between CFO and loss, showing an acceptable level of correlation.

In this univariate analysis, EAF is negatively correlated with CoD and abnormal accruals, suggesting that it has higher audit quality, which is consistent with our expectation. CoD is also correlated with higher quick ratio, loan maturity and lower size, ROA, tangible, and Altman score, abnormal accruals are correlated with higher sales growth and lower ownership concentration. These univariate correlations are consistent with expectation and with results from the following multivariate analysis.

MULTIVARIATE REGRESSION ANALYSIS

Endogeneity issue

To consider the endogeneity issue, we perform our analysis on the propensity score matched sample. The first and third model in Table 5 show the model to identify the propensity score sample using a logistic regression for the audit firm choice. The analysis to identify the propensity score matched sample with the logistic regressions^{xviii} (first and third model) confirms the usefulness of PSM to reduce bias and to improve the robustness of the main analysis: from a sample of 1798 observations, the PSM sample is 1206 (603 EAF and 603 DAF) and the mean and median bias is significantly reduced (from 10.5/7.3 in the first model to 3.3/2.2 in the second model and from 10.00/6.2 in the third model to

4.6/3.2 in the fourth model) with a p-value of the bias test that loses its significance as sign of an effective first stage.

Test of hypothesis

The second model in Table 5 shows our findings related to CoD computed in the propensity score matched sample identified. The fourth model shows our results related to Abnormal Accruals computed in the propensity score matched sample identified (Francis and Wang, 2008). In the OLS regression on the matched sample using PSM, both the coefficient on EAF of CoD (second model) and EM (fourth model) are negative and statistically significant. Specifically, results show that: a) private clients of EAF are associated with lower CoD by 1.1% (including interest expenses and commissions), that is, 7.6% of EBIT^{xix}, compared to the clients of DAF; b) private clients of EAF are associated with lower EM of 1.7% of abnormal accruals over total assets. The Adj. R² of 4.6 - 7.3% of the regression on the PSM sample is comparable to other Cost of Financial Debt models in prior studies [e.g. 8.8% in Gul et al. (2013) and 9% in Karjalainen (2011)].

Control variables

Significant control variables in the models analyzed show a negative relation between size, Altman score, loan maturity and CoD, and a positive relation between quick ratio and CoD. Size is inversely related to bankruptcy because debt holders demand higher interest to cover this higher risk (Lai, 2011; Bharath et al., 2008; Graham et al., 2008; Aobdia et al., 2015); the lender requires a liquidity premium for longer-term debt, and this liquidity premium translates into higher loan spread (Bharath et al., 2008; Aobdia et al., 2015; Graham et al., 2008; Lai, 2011; Karjalainen, 2011). On the other hand, the quick ratio does not drive the choice of more expensive credit. In the EM analysis, significant control variables show a negative relation between size and abnormal accruals; and a positive relation between growth, standard deviation of cash flow and abnormal accruals. This confirms that information environment, capital market pressure, and higher financial resources for bigger firms decrease EM (Dechow et al., 2010); and that growth and standard deviation of cash flows are important determinants of abnormal accruals (Francis and Wang, 2008; Dechow et al. 1995).

Alternative cost of debt and earnings quality measures

We repeat the analysis using a different proxy of the

Table 4. Correlation matrix.

Panel A – Cost of Debt analysis (N=1206)		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	CoD	1.000													
2	EAF	-0.058	1.000												
3	Size	-0.056	0.000	1.000											
4	Leverage	-0.006	0.021	-0.118	1.000										
5	Loss	0.071	-0.007	-0.154	0.141	1.000									
6	Asset Turnover	-0.060	0.018	-0.031	0.279	-0.227	1.000								
7	Quick	0.058	-0.004	-0.004	-0.359	-0.033	-0.094	1.000							
8	Size Square	-0.048	0.002	0.995	-0.115	-0.152	-0.036	-0.006	1.000						
9	ROA	-0.063	0.004	0.149	-0.176	-0.512	0.226	0.078	0.137	1.000					
10	Tangible	-0.078	-0.072	0.115	-0.263	0.050	-0.270	-0.012	0.108	0.006	1.000				
11	Altman	-0.067	0.037	0.018	-0.292	-0.221	0.571	0.179	0.010	0.364	-0.144	1.000			
12	Negative Equity	0.020	0.050	-0.136	0.291	0.262	-0.084	-0.045	-0.124	-0.338	-0.021	-0.205	1.000		
13	Loan Maturity	0.085	0.052	-0.127	0.177	-0.089	0.374	-0.382	-0.122	0.054	-0.411	0.194	0.048	1.000	
14	Ownership Concentration	0.028	0.037	-0.076	0.067	0.133	-0.044	-0.023	-0.071	-0.103	0.007	-0.099	0.108	0.061	1.000

Panel B – Earnings Management analysis (950)		1	2	3	4	5	6	7	8	9	10	11	12	13
1	ABN. ACC	1.000												
2	EAF	-0.040	1.000											
3	Size	-0.019	0.004	1.000										
4	Leverage	-0.029	0.010	-0.009	1.000									
5	Loss	-0.028	0.037	-0.165	0.247	1.000								
6	Asset Turnover	0.090	-0.013	-0.049	0.262	-0.204	1.000							
7	Quick	-0.018	-0.017	-0.021	-0.417	-0.056	-0.152	1.000						
8	Size Square	-0.017	0.004	0.995	-0.003	-0.160	-0.050	-0.027	1.000					
9	Sales Growth	0.228	0.021	0.143	0.005	-0.082	0.193	-0.053	0.140	1.000				
10	SDCFO	-0.050	0.091	-0.122	-0.058	0.084	-0.152	0.168	-0.112	-0.179	1.000			
11	CFO	0.018	0.022	0.125	-0.274	-0.387	0.069	0.127	0.116	0.029	0.145	1.000		
12	Altman	-0.016	0.006	-0.007	-0.357	-0.105	0.072	0.706	-0.015	0.024	0.136	0.105	1.000	
13	Ownership Concentration	-0.085	0.043	-0.062	0.125	0.184	-0.079	0.029	-0.066	-0.086	0.230	-0.031	-0.051	1.000

Pearson correlation coefficient. Refer to Appendix A for variable definitions. Significant coefficient at 0.10 are in bold. Variable definition in Appendix A.

dependent variable CoD. We compare the financial costs to different values of the debt, changing the denominator of the variables. We use a more restricted Cost of interest-bearing

Debt, including only the Cost of Bank Debt^{xx}. This is an interesting measure in Italy where private companies are mainly financed by banks and not by bonds, as shown by the descriptive statistics.

The results are confirmed (Table 6, Model 1).

We also repeat the analysis using the credit default risk rating provided by mode Finance. This company provides the Multi Objective Rating

Table 5. Multivariate analysis between EAF and DAF within non-Big4.

Multivariate analysis	Cost of Financial Debt				Abnormal Accruals (Francis and Wang, 2008)			
	Model 1		Model 2		Model 3		Model 4	
	Logistic regression: DAF		PSM: Cost of Debt		Logistic regression: DAF		PSM: Abnormal accruals	
	Estimate	P-value	Estimate	P-value	Estimate	P-value	Estimate	P-value
EAF			-0.011	0.026			-0.017	0.090
Size	-0.886	0.021	0.000	0.866	-0.341	0.423	-0.010	0.006
Leverage	-0.680	0.010	-0.018	0.270	-0.521	0.077	-0.031	0.179
Loss	-0.411	0.001			-0.491	0.001	0.008	0.502
Asset Turnover	-0.015	0.792			-0.016	0.254		
Quick	0.022	0.658	0.008	0.028	-0.089	0.197		
Size Square	0.030	0.121			0.001	0.971		
ROA			-0.039	0.508				
Tangible			-0.018	0.149				
Altman			-0.007	0.000				
Negative Equity			-0.006	0.757				
Loan Maturity			0.053	0.000				
Sales Growth							0.083	0.000
SDCFO							0.062	0.040
CFO							0.048	0.470
Altman							-0.001	0.164
Ownership Concentration			0.008	0.663			-0.020	0.340
Constant	7.195	0.002	0.029	0.316	2.829	0.236	0.277	0.000
Pseudo / Adjusted R-Squared		0.049		0.046		0.054		0.098
Year and Industry Fixed Effect		included		included		included		included
Observations		1798		1206		1162		950
Mean bias		10.5		3.3		10.0		4.6
Median bias		7.3		2.2		6.2		3.2
P-value		0.000		0.850		0.000		0.720

Coefficient p-values are two-tailed, based on asymptotic t-statistics using White (1980) standard errors. Pseudo R2 for PSM p-values are two-tailed. Refer to Appendix A for variable definitions. We use DAF in the logistic regression due to the difference in the number of their clients compared to EAF, to be able to perform a matching with replacement. We use EAF in the main analysis for an easier interpretation.

Evaluation (MORE) in order to assess the level of distress of industrial companies. It provides a creditworthiness opinion (Assessment) of risk class on the following ten-point scale: AAA

(extremely strong), AA (strong), A (high solvency), BBB (adequate), BB (adequate in the country-industry), B (vulnerable), CCC (dangerous), CC (high vulnerable), C (pathological situations), D

(no capacity to meet financial commitments). The rating can be used for access to loans in negotiations with banks. We use the following regression model based on Li et al. (2010) and

Table 6. Alternative measure of Cost of Debt and of EQ.

Measure	Model 1		Model 2		Model 3	
	Cost of Bank Debt: Financial expenses / bank debt		Credit default Rating class		Meet or beat benchmark; Small earnings increase = 1 if $0 < [(earnings/total\ assets)_t / (earnings/total\ assets)_{t-1}] \leq 0.02$, and zero otherwise	
	Estimate	P-value	Estimate	P-value	Marginal effect	P-value
EAF	-0.012	0.021	0.881	0.023	-0.079	0.020
Control variables	...	...	...	...	...	...
Adjusted R-Squared	0.054		0.482		0.230	
Year / Industry Fixed Effect	Included		Included		Included	
Observations	1206		210		292	

Coefficient p-values are two-tailed, based on asymptotic t-statistics using White (1980) standard errors. Refer to Appendix A for variable definitions. Meet or beat benchmark uses a dummy dependent variable related to the meet or beat the threshold of zero earnings (to avoid reporting a loss) and thus, use a logistic multivariate regression, for which we report the marginal effects.

Mansi et al. (2004):

$$\text{Rating} = \alpha + \beta_1 \text{EAF} + \beta_2 \text{SIZE}_{it} + \beta_3 \text{LEVERAGE}_{it} + \beta_4 \text{ROA}_{it} + \beta_5 \text{SALES GROWTH}_{it} + \beta_6 \text{LOAN MATURITY}_{it} + \beta_7 \text{BANK DEBT}_{it} + \beta_8 \text{ALTMAN}_{it} + \beta_9 \text{COVERAGE}_{it} + \text{industry fixed effect} + \text{year fixed effect} + e$$

In addition to the control variables used in the main analysis, we add Bank debt (natural logarithm of bank debt) and Coverage (operating income after depreciation divided by interest expense). We requested the data on this rating for the matched sample used in the CoD analysis, and received data for a sample of observations for the year 2014. Results show that clients of EAF are associated with higher ratings than firms with a lower default risk (Table 6, Model 2).

Given the shortcomings of the measurement of abnormal accruals, we repeated the analysis using another model for EM. We were interested in seeing whether the results were driven by our chosen measurement of EM. The small earnings increase model, computed at the 2% level, is a proxy of EM, interpreted as the meet or beat benchmark.^{xxi} This model measures manipulation implemented to increase earnings every year. We chose the earnings of year t-1 as a benchmark (Barth et al., 2008; Burgstahler and Dichev, 1997; Burgstahler et al., 2006; Cameran and Prencipe, 2011; Frankel et al., 2002; Leuz et al., 2003; Van Tendeloo and Vanstraelen, 2008). Results are qualitatively the same (Table 6, Model 3).

Propensity score matched sample

PSM can be performed with many specifications. We repeat the analysis with kernel matching, in which all treated units are matched with a weighted average of all control units with weights that are inversely proportional to the distance between the propensity scores of treated

units and control units. Calculation of weighting depends on the specific kernel function adopted. We repeat the analysis without replacement, changing the caliper distance at 0.5% and switching from one-to-one to one-to-many matching. We follow D'Attoma and Pacei (2014) in presenting the results for different methods of PSM.

Table 7 reports that after matching, the mean bias for all explanatory variables is reduced to acceptable levels (Harder et al., 2010). It falls from about 10.0/17.6 before matching to about 7.2/2.2 after matching. Table 7 also reports that after matching, the p-values of the joint significance of the explanatory variables are not significantly different between the treatment group and the control group. In short, these test statistics suggest that the matching method is appropriate. Results reported in Table 8 confirm the main analysis findings.

To investigate whether a high quality auditor reduces CoD, Coarsened Exact Matching (CEM) is also used (Table 7). CEM overcomes some of the limitations inherent in PSM (King et al., 2011; Iacus et al., 2012). CEM is a more robust matching technique that is not subject to random matching, because it directly matches on a coarsened range of covariates and does not rely on a first-stage propensity score model. DeFond et al. (2016) encourage research to explore the use of CEM in complementing regression analysis for the purpose of providing robust inferences. We use the same variables used in the first stage propensity score to perform the match. CEM shows the same results as PSM. We can therefore conclude that results are not driven by endogeneity.

Similar market share

To check whether the differences are due to the audit firms' characteristics analyzed and not due to the different size, we perform the analysis comparing audit firms of the same size, that is, we look at the lowest

Table 7. Alternative estimation of propensity score matching.

PS matching	Cost of financial debt			Abnormal accruals		
	Mean bias (Median bias) <i>p</i> -value		Estimate (N)	Mean bias (Median bias) <i>p</i> -value		Estimate (N)
	Before matching	After matching		Before matching	After matching	
EAF						
Kernel (normal; bandwidth = 0.06)		2.3 (2.0) 1.000	-0.009** (1791)		2.6 (2.4) 1.000	-0.016* (1131)
Without replacement		2.2 (1.7) 0.997	-0.010** (1106)		2.2 (1.8) 1.000	-0.018* (799)
Caliper (0.005)	10.5 (7.3) 0.000	3.1 (2.6) 0.919	-0.010** (1168)	10.0 (6.2) 0.000	4.4 (3.6) 0.831	-0.018* (930)
One-to-many (many=3)		3.0 (2.8) 0.974	-0.008* (1448)		3.1 (2.7) 0.994	-0.016* (1001)
CEM			-0.07* (1104)			0.007 (688)

Coefficient *p*-values are one-tailed, based on asymptotic *t*-statistics using White (1980) standard errors and clustered by firms. Pseudo R2 for PSM *p*-values are two-tailed. See Appendix A for variable definitions. Results for Kernel (normal) and Kernel (Epanechnikov) are very similar.

Table 8. Audit firm market share and International Financial Reporting Standards (IFRS).

Analysis	Model 1		Model 2	
	Within audit firms with a market share higher than 0.5% between EAF and DAF		Between EAF and DAF Interaction with IFRS	
Cost of debt	Estimate	P-value	Estimate	P-value
EAF	-0.019	0.007	-0.013	0.002
EAF*IFRS			0.089	0.178
Control variables	...	...	...	...
Adjusted R-squared	0.053		0.043	
Year / industry fixed effect	Included		Included	
Observations	330		1202	
Abnormal accruals	Estimate	P-value	Estimate	P-value
EAF	-0.032	0.090	-0.001	0.993
EAF*IFRS			-0.037	0.681
Control variables	...	...	...	...
Adjusted R-Squared	0.062		0.069	
Year / Industry Fixed Effect	Included		Included	
Observations	271		1015	

Coefficient *p*-values are one-tailed, based on asymptotic *t*-statistics using White (1980) standard errors and clustered by firms. See Appendix A for variable definitions. All the regressions presented are run on the propensity score matched sample. This sample is the output of the first model with dependent variable the auditor choice. For the IFRS analysis the first stage regression includes also a dummy variable of 1 if IFRS and 0 if Italian GAAP, to define the propensity score matched sample.

market share among the market share of the EAF and we restrict the sample to audit firms with market share higher than this. In our sample we have bigger firms in DAF than in EAF, and can therefore state that size is not the main driver of this study. Thus, we compare the 20 EAF with the 13 DAF with a similar market share (higher than 0.5%)^{xxii}. Results in Table 8 – Model 1 confirm that EAF have a lower CoD and EM than DAF of similar size.

IFRS versus Italian GAAP

Effects would be higher if private clients use the same set of standards as public clients. In general, private firms

adopt Italian GAAP and some of them voluntarily adopt IFRS. We repeat the regression adding an interaction between audit firm choice (EAF vs DAF) and a dummy variable that takes value 1 if the firm voluntarily adopts IFRS and 0 otherwise. Results for the interaction in Table 8 – Model 2 show significant negative coefficients for the interaction EAF*IFRS. The externalities are higher when the client adopts the same standards as the public clients that the firm also audits.

Other countries with high third-party liability

We select other European countries where the statutory

Table 9. Additional analysis: other countries.

PS matching	Cost of financial debt			Abnormal accruals		
	Mean bias (Median bias) <i>p</i> -value (N)		Estimate (N)	Mean bias (Median bias) <i>p</i> -value		Estimate (N)
	Before matching	After matching		Before matching	After matching	
EAF						
Sweden	14.5 (7.9) 0.000 (N=1301)	5.2 (3.3) 0.032	-0.014* (897)	14.5 (7.9) 0.000 (N=2694)	2.7 (1.5) 0.848	-0.007* (1788)
Belgium	3.4 (2.4) 0.000 (N=3657)	1.1 (1.2) 1.000	-0.010* (3156)	3.4 (2.4) 0.000 (N=5579)	1.8 (1.1) 0.672	-0.003* (4680)
Denmark	5.4 (2.7) 0.000 (N=2269)	2.0 (1.3) 0.997	-0.007* (2052)	Too few observations to compute abnormal accruals		
Finland	10.2 (5.1) 0.000 (N=7180)	2.3 (2.2) 0.656	-0.002 (4375)	10.2 (5.1) 0.000 (N=7025)	1.6 (1.1) 0.743	-0.011* (5702)

Coefficient and F-test *p*-values are one-tailed, based on asymptotic *t*-statistics using White (1980) standard errors and clustered by firms. See Appendix A for variable definitions. Year and industry fixed effect included. Because data was not available, the control variable for the ownership concentration is not included. In our sample Belgium has 205 Non-Big4; Finland has 70 Non-Big4; Denmark has 384 Non-Big4; Sweden has 55 Non-Big4; France has 1977 Non-Big4. Within these Non-Big4 in each country, EAF are the same 20 listed in the variable definition table (Appendix A), except that PKF and BKR are not present in Finland, and Morison is not present in Finland or Sweden. The sample includes audit firms with at least 2 clients per year. The number of non-Big4 audit firms is computed aggregating audit firms with different names into a single audit firm if they are part of the same group.

auditor liability to any third party mainly arises from a breach of duty in tort^{xxiii}. On the basis of data availability, we select Belgium (De Poorter, 2008), Sweden (Spirkle, 2013), Finland and Denmark. Financial statement data and data on auditor and date of appointment of the auditor was downloaded from Bureau van Dijk. Data aggregating the audit firms in their global audit firm network was prepared, using the same selection criteria earlier presented as shown at the bottom of Table 9.

Table 9 shows the reduction of the mean and median bias using the PSM on these data with the same variables as presented above. The first two columns show that mean and median bias are higher before matching than after matching, and that the respective *p*-values becomes less significant. Table 9 also presents the estimate coefficient of EAF with the respective numbers of observations. Analysis is run country by country. Results show at least one negative association between EAF and lower CoD/EM for each country in the two combinations (EAF and CoD; EAF and EM).

The graphic representation (Figure 2) shows the mean differences in COD and abnormal accruals in Italy, Sweden, Belgium, Denmark and Finland. Cost of financial debts and cost of bank debts have a similar value and trend in Italy. Italy has lower values of COD and abnormal accruals while Belgium has higher value for them. However, in all countries, it is possible to see a significant reduction in their average in EAF compared to DAF.

DISCUSSION

Using a PSM sample of private companies audited by non-Big4 in the period 2010 - 2014, we find that EAF are associated with lower CoD and EM, contributing to increasing audit quality and reducing agency costs. Differently from the traditional criterion based on size

of audit firms (BigN vs non-Big4), that could not be effective in the non-Big4 setting, we find that audit firms that operate at European level allow the lowering of CoD and EM, given the higher reputation and quality of these audit firms compared with DAF. Previous benefits could be justified because EAF have high reputation costs (DeAngelo, 1981) and high competitive advantages in terms of reputation and competence, e.g. ability to operate across multiple business environments, efficient audit methodology, and staff with professionally certified knowledge of national legislation (Carson, 2009). Moreover, the stricter and different audit environment (Maijor and Vanstraelen, 2006), enforcement (Van Buuren et al., 2014; Kleinman et al., 2014) and litigation risk prevailing in European countries is a further possible explanation for these findings. Our results support the view that additional competences gained by non-Big4 that operate in the European network, has a high marginal value. We reject the counterargument that DAF being more specialized in the country where they operate have lower CoD and EM. The paper argues that decentralization is not the driver of audit quality at country level. The robustness tests confirm all our main results, and supply interesting indications on credit default rating, and international comparison with countries characterized by similar competitiveness and litigation regulation of the audit market. We find that EAF yield benefits in terms of higher ratings. Finally, our results are not limited to Italy, but can be extended to Sweden, Belgium, Denmark and Finland.

Conclusion

Following the framework of DeFond and Zhang (2014), this research analyses the association between audit firm choice criteria (supply of Audit Quality) and CoD and EM (demand of Audit Quality). While several studies in public

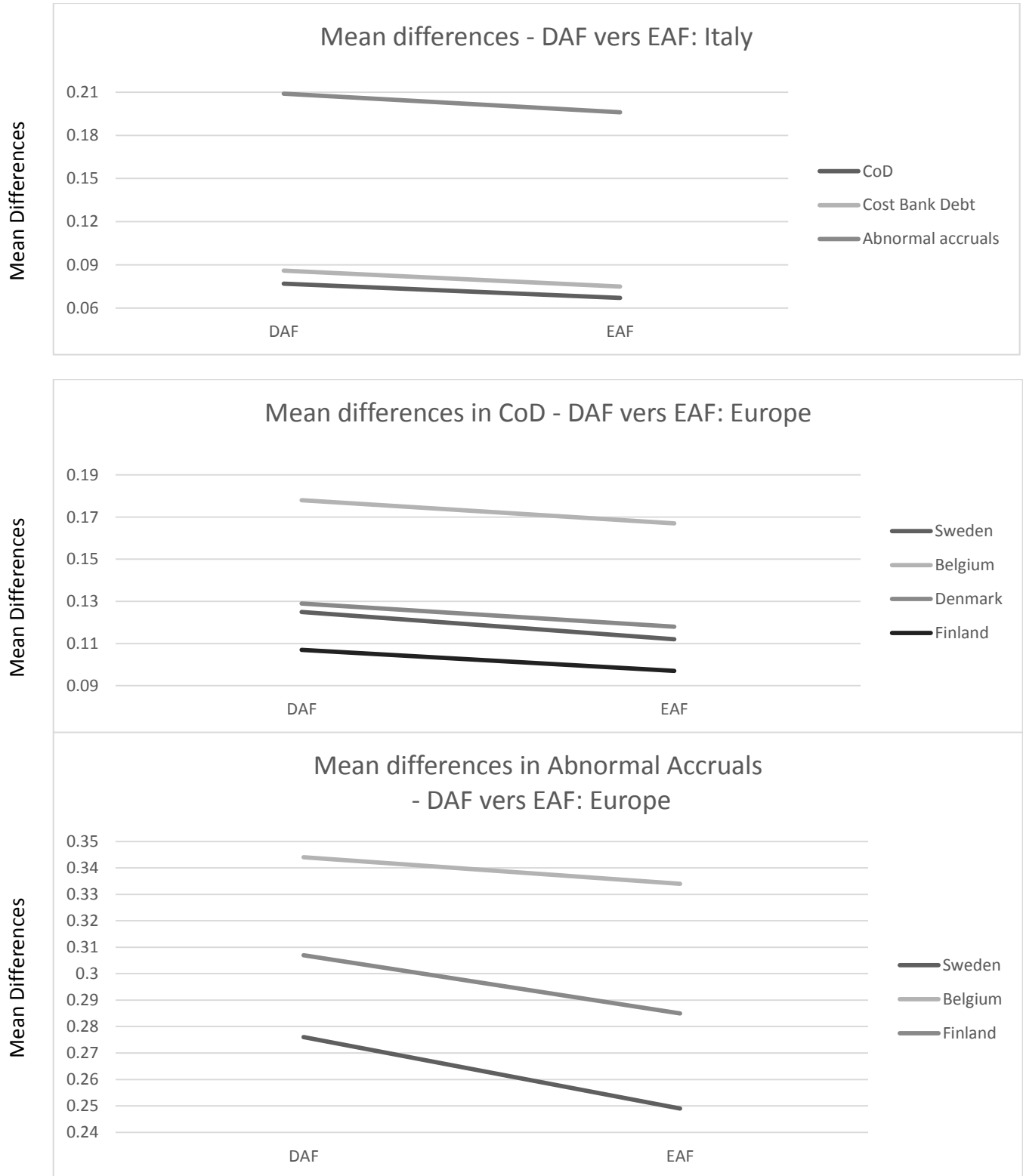


Figure 2. Cost of Debt, Cost of Bank Debt and Abnormal accrual in EAF compared with DAF.

companies find that size criterion based on BigN vs non-BigN is effective in improving earnings and audit quality

and lower CoD, in the private firm and non-BigN audit market, useful audit firm choice criteria are not

immediately clear. We believe that in an audit market with high levels of competition, as envisaged by the Green paper (European Commission, 2010), our analysis will be useful to identify a new criterion (based on the European boundaries of the audit market) that positively affect the agency conflicts between lenders and owners/managers in private firms, through lower CoD and EM.

Finding suggests that this audit firm choice criterion is useful to explain agency costs: the higher audit quality offered by EAF reduces risks related to earnings management and allows lenders to accept lower level of interests with benefits for all stakeholders. Regulators could benefit from the results of this research as they could become better aware about consequences of policies on audit independence and competitiveness in the audit market. Regulators currently aiming to improve the competitiveness of audit market will find these findings of interest and could evaluate the opportunity to improve non-Big4 audit firm segment, with special emphasis to EAF. EAF in the non-Big4 more competitive audit market segment appear likely to be associated with lower CoD, EM and agency costs of the clients. Auditor quality, and especially audit independence, is of interest of several stakeholders, such as investors, firms and also other stakeholders. Cutting across all publicly traded corporations is the concern that further regulation of the accounting profession may bring additional regulations in other areas such as corporate governance and capital formation (Kinney, 1999; Gerde and White, 2003).

Results are valid to countries characterized by higher audit market competitiveness, like Italy, Belgium, Denmark and Finland, where the non-BigN market share is higher significant. This explorative analysis could be further investigated in future research to confirm our results in other European countries or in other setting characterized by high audit market share for non-Big4 in private companies.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

REFERENCES

- Allee KD, Yohn TL (2009). The Demand for Financial Statements in an Unregulated Environment: An Examination of the Production and Use of Financial Statements by Privately Held Small Businesses. *Account. Rev.* 84(1):1-25.
- Altman EI (1983). *Corporate Financial Distress: A Complete Guide to Predicting, Avoiding, and Dealing with Bankruptcy*. New York: John Wiley and Sons. Retrieved from https://books.google.it/books/about/Corporate_Financial_Distress.html?id=GbS-AAAAIAAJ&pgis=1
- Anantharaman D, Pittman JA, Wans N (2016). State liability regimes within the United States and auditor reporting. *Account. Rev.* 91(6):1545-1575.
- Aobdia D, Lin C, Petacchi R (2015). Capital Market Consequences of Audit Partner Quality. *Account. Rev.* 90(6):2143-2176.
- Azizkhani M, Monroe GS, Shailer G (2013). Audit partner tenure and cost of equity capital. *Auditing- J. Pract. Th.* 32(1):183-202.
- Bansal P, Clelland I (2004). Talking trash: Legitimacy, impression management, and unsystematic risk in the context of the natural environment. *Acad. Manage. J.* 47:93-103.
- Barth ME, Landsman WR, Lang MH (2008). International accounting standards and accounting quality. *J. Account. Res.* 46(3):467-498.
- Baumann-Pauly D, Wickert C, Spence LJ, Scherer AG (2013). Organizing corporate social responsibility in small and large firms: Size matters. *J. Bus. Ethics* 115:693-705.
- Baylis RM, Burnap P, Clatworthy MA, Gad MA, Pong CKM (2017). Private lenders' demand for audit. *J. Account. Econ.* 64(1):78-97.
- Beattie V, Fearnley S (1995). The Importance of Audit Firm Characteristics and the Drivers of Auditor Change in UK Listed Companies. *Account. Bus. Res.* 25(100):227-239.
- Becker CL, DeFond ML, Jiambalvo J, Subramanyam KR (1998). The effect of audit quality on earnings management. *Contemp. Account. Res.* 15(1):1-24.
- Behn BK, Choi J, Kang T (2008). Audit Quality and Properties of Analyst Earnings Forecasts. *Account. Rev.* 83(2):327-349.
- Bharath ST, Sunder J, Sunder SV (2008). Accounting Quality and Debt Contracting. *Account. Rev.* 83(1):1-28.
- Blackwell DW, Noland TR, Winters DB (1998). The Value of Auditor Assurance: Evidence from Loan Pricing. *J. Account. Res.* 36(1):57-70.
- Blanco-Mazagatos V, Quevedo-Puente E De, Castrillo LA (2007). The Trade-Off Between Financial Resources and Agency Costs in the Family Business: An Exploratory Study. *Family Bus. Rev.* 20(3):199-213.
- Boone JP, Khurana IK, Raman KK (2010). Do the Big 4 and the Second-tier firms provide audits of similar quality? *J. Account. Pub. Pol.* 29(4):330-352.
- Burgstahler DC, Hail L, Leuz C (2006). The importance of reporting incentives: Earnings management in European private and public firms. *Account. Rev.* 81(5):983-1016.
- Burgstahler D, Dichev I (1997). Earnings management to avoid earnings decreases and losses. *J. Account. Econ.* 24(1):99-126.
- Bushman RM, Landsman WR (2010). The pros and cons of regulating corporate reporting: A critical review of the arguments. *Account. Bus. Res.* 40(3):259-273.
- Cameran M, Francis JR, Marra A, Pettinicchio AK (2015). Are There Adverse Consequences of Mandatory Auditor Rotation? Evidence from the Italian Experience. *Audit- J. Practice Th.* 34(1):1-24.
- Cameran M, Prencipe A (2011). Audit Quality and Auditor Type. Evidence from Italian private companies. *Economia Manage.* Pp.99-115.
- Campa D (2013). "Big 4 fee premium" and audit quality: latest evidence from UK listed companies. *Managerial Audit. J.* 28(8):680-707.
- Cano-Rodríguez M, Alegría SS (2012). The value of audit quality in public and private companies: evidence from Spain. *J. Manage. Governance* 16(4):683-706.
- Carcello JV, Hermanson RH, McGrath NT (1992). Audit Quality Attributes: The Perceptions of Audit Partners, Preparers, and Financial Statement Users. *Audit- J. Practice Th.* 11(1):1-15. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=9703122164&lang=pt-br&site=eds-live>
- Carson E (2009). Industry specialization by global audit firm networks. *Account. Rev.* 84(2):355-382.
- Cassell CA, Giroux G, Myers LA, Omer TC (2013). The Emergence of Second-Tier Auditors in the US: Evidence from Investor Perceptions of Financial Reporting Credibility. *J. Bus. Financ Account.* 40(3-4):350-372.
- Causholli M, Knechel WR (2012). Lending relationships, auditor quality and debt costs. *Manage. Audit. J.* 27(6):550-572.
- Chaney PK, Jeter DC, Shivakumar L (2004). Self-Selection of Auditors and Audit Pricing in Private Firms. *Account. Rev.* 79(1):51-72.
- Chang H, Cheng CSA, Reichelt KJ (2010). Market reaction to auditor switching from big 4 to third-tier small accounting firms. *Audit - J. Practice Th.* 29(2):83-114.
- Chang X, Dasgupta S, Hikiry G (2009). The effect of auditor quality on financing decisions. *Account. Rev.* 84(4):1085-1117.
- Chatterji AK, Toffel MW (2010). How firms respond to being rated. *Strateg. Manage. J.* 31:917-945.

- Chen PF, He S, Ma Z, Stice D (2016). The information role of audit opinions in debt contracting. *J. Account. Econ.* 61(1):121-144
- Chin C, Yao W, Liu P (2014). Industry Audit Experts and Ownership Structure in the Syndicated Loan Market: At the Firm and Partner Levels. *Account. Horizons* 28(4):749-768.
- Choi JH, Kim JB, Liu X, Simunic DA (2008). Audit Pricing, Legal Liability Regimes, and Big 4 Premiums: Theory and Cross-country Evidence. *Contemp. Account. Res.* 25(1):55-99.
- Choi JH, Lee WJ (2014). Association between Big 4 auditor choice and cost of equity capital for multiple-segment firms. *Account. Financ.* 54(1):135-163.
- Choi J, Wong T (2007). Auditors' Governance Functions and Legal Environments: An International Investigation*. *Contemp. Account. Res.* 24(1):13-46.
- Claus J, Thomas J (2001). Equity Premia as Low as Three Percent? Evidence from Analysts' Earnings Forecasts for Domestic and International Stock Markets. *J. Financ.* 56(5):1629-1666.
- Collis J (2012). Determinants of voluntary audit and voluntary full accounts in micro- and non-micro small companies in the UK. *Account. Bus. Res.* 42(4):441-468.
- D'Attona I, Pacei S (2014). Offshoring and firm performance: Evidence from the Italian manufacturing industry. *Rev. Dev. Econ.* 18(1):29-44.
- Damanpour F (1987). The adoption of technological, administrative, and ancillary innovations: Impact of organizational factors. *J. Manage.* 13:675-688.
- Damanpour F (1996). Organizational complexity and innovation: Developing and testing multiple contingency models. *Manage. Sci.* 42:693-716.
- DeAngelo LE (1981). Auditor size and audit quality. *J. Account. Econ.* 3(3):183-199.
- De Poorter I (2008). Auditor's liability towards third parties within the EU: A comparative study between the United Kingdom, the Netherlands. *J. Int. Commercial Law Technol.* 3(1):68-75.
- Dechow P, Ge W, Schrand C (2010). Understanding Earnings Quality: A Review of Proxies, their Determinants and their Consequences Importance of Earnings Quality in Accounting Research. *J. Account. Econ.* 50(2-3):344-401.
- Dechow PM, Sloan RG, Sweeney AP (1995). Detecting Earnings Management. *Account. Rev.* 70(2):193-225.
- Dedman E, Kausar A (2012). The impact of voluntary audit on credit ratings: evidence from private UK firms. *Account. Bus. Res.* 42(4):397-418.
- Dedman E, Kausar A, Lennox C (2014). The Demand for Audit in Private Firms: Recent Large-Sample Evidence from the UK. *Eur. Account. Rev.* 23(1):1-23.
- DeFond M, Erkens DH, Zhang J (2016). Do Client Characteristics Really Drive the Big N Effect? Evidence from Propensity Score Matching. *Manage. Sci.* 63(11):3628-3649.
- DeFond, M. L., & Jiambalvo, J. (1994). Debt covenant violation and manipulation of accruals. *J. Account. Econ.* 17(1-2):145-176.
- DeFond M, Zhang J (2014). A review of archival auditing research. *J. Account. Econ.* 58(2-3):275-326.
- Demartini C, Trucco S (2016). Audit risk and corporate governance: Italian auditors' perception after the global financial crisis. *Afr. J. Bus. Manage.* 10(13):328-339.
- Dichev ID, Skinner DJ (2002). Large-sample evidence on the debt covenant hypothesis. *J. Account. Res.* 40(4):1091-1123.
- Easton PD (2004). PE Ratios, PEG Ratios, and Estimating the Implied Expected Rate of Return on Equity Capital. *Account. Rev.* 79(1):73-95.
- EC DG - Internal Market and Services. (2006). Questionnaire on the legal systems of civil liability of statutory auditors in the European Union. In Partial update of the study carried out by Thieffry & Associates in 2001.
- Eshleman JD, Guo P (2014). Do Big 4 Auditors Provide Higher Audit Quality after Controlling for the Endogenous Choice of Auditor? *Audit-J. Practice Th.* 33(4):197-219.
- European Commission (2001). A study on systems of civil liability of statutory auditors in the context of a Single Market for auditing services in the European Union. Available at: http://ec.europa.eu/internal_market/auditing/docs/liability/auditliability_en.pdf.
- European Commission (2010). GREEN PAPER. Audit Policy: Lessons from the Crisis, Brussels. Available at: <http://eur-europa.eu/>.
- European Parliament (1984). Eighth Council Directive 1984/253/EEC of 10 April 1984 based on Article 54 (3) (g) of the Treaty on the approval of persons responsible for carrying out the statutory audits of accounting documents. Available from: [Http://eur-Lex.europa.eu/legal-content/EN/TXT/?qid=1441117442656&uri=CELEX:31984L0253](http://eur-Lex.europa.eu/legal-content/EN/TXT/?qid=1441117442656&uri=CELEX:31984L0253).
- European Parliament (2006a). Directive 2006/43/EC of the European Parliament and of the Council of 17 May 2006 on statutory audits of annual accounts and consolidated accounts, amending Council Directives 78/660/EEC and 83/349/EEC and repealing Council Directive 84/253/EEC. Available from: [Http://eur-Lex.europa.eu/legal-content/GA/TXT/?uri=CELEX:32006L0043](http://eur-Lex.europa.eu/legal-content/GA/TXT/?uri=CELEX:32006L0043), (May 2006), 1-33.
- European Parliament (2006b). Regulation Number 1893 of the European Parliament and of the Council of 20 December 2006.
- Ferguson A, Francis JR, Stokes DJ (2003). The effects of firm-wide and office-level industry expertise on audit pricing. *Account* 78(2):429-448.
- Financial Reporting Council (2006). Paragraph 6 of schedule 10 of the 2006 Act, Available at <https://www.frc.org.uk/Our-Work/Condu>.
- Firth M (1999). Company takeovers and the auditor choice decision. *J. Int. Account. Audit. Taxation* 8(2):197-214.
- Fleischer R, Goettsche M (2012). Size effects and audit pricing: Evidence from Germany. *J. Int. Account. Audit. Tax.* 21(2):156-168.
- Fortin S, Pittman JA (2007). The Role of Auditor Choice in Debt Pricing in Private Firms. *Contemp. Account. Res.* 24(3):859-896.
- France Parliament (2013). Code de commerce. Art. R. 822-19, Available at: <https://www.cncc.fr/sections/document>.
- Francis JR, Khurana IK, Pereira R (2005). Disclosure incentives and effects on cost of capital around the world. *Account. Rev.* 80(4):1125-1162.
- Francis JR, Maydew EL, Sparks HC (1999a). The Role of Big6 Auditors in the Credible Reporting of Accruals. *Auditi- J. Practice Th.* 18(2):17-34.
- Francis JR, Richard C, Vanstraelen A (2009). Assessing France's Joint Audit Requirement: Are Two Heads Better than One? *Auditi- J. Practice Th.* 28(2):35-63.
- Francis JR, Stokes DJ, Anderson D (1999b). City Markets as a Unit of Analysis in Audit Research and the Re-Examination of Big 6 Market Shares. *Abacus* 35(2):185-206.
- Francis JR, Wang D (2008). The joint effect of investor protection and big 4 audits on earnings quality around the world. *Contemp. Account. Res.* 25(1):157-191.
- Francis JR, Wilson ER (1988). Auditor Changes: A Joint Test of Theory Relating to Agency Costs and Auditor Differentiation. *Account. Rev.* 63(4):663-682.
- Francis JR, Yu MD (2009). Big Four Office Size and Audit Quality. *Account. Rev.* 84(5):1521-1552.
- Frankel RM, Johnson MF, Nelson KK (2002). The Relation between Auditors' Fees for Nonaudit Services and Earnings Management. *Account. Rev.* 77(Supplement):71-105.
- Gallo PJ, Christensen LJ (2011). Firm size matters: An empirical investigation of organizational size and ownership on sustainability-related behaviors. *Bus. Soc.* 50(2):315-349.
- Gao Y, Khan M, Tan L (2017). Further Evidence on Consequences of Debt Covenant Violations. *Contemp. Account. Res.* 34(3):1489-1521.
- Gaver JJ, Paterson JS (2001). The Association between External Monitoring and Earnings Management in the Property-Casualty Insurance Industry. *J. Account. Res.* 39(2):269-282.
- Gebhardt WR, Lee CMC, Swaminathan B (2001). Toward an Implied Cost of Capital. *J. Account. Res.* 39(1):135-176.
- Geiger MA, Rama DV (2006). Audit firm size and going-concern reporting accuracy. *Account. Horizons*, 20(1):1-17.
- Gerayli MS, Yanesari AM, Ma'atoofi AR (2011). Impact of Audit Quality on Earnings Management: Evidence from Iran. *Int. Res. J. Financ. Econ.* 66:77-84.
- Gerde VW, White CG (2003). Auditor Independence, Accounting Firms, and the Securities and Exchange Commission. *Bus. Soc.* 42(1):83-114.
- Giudici P (2012). Auditors' Multi-Layered Liability Regime. *Eur. Bus. Organ. Law Rev.* 13(4):501-555.

- Gode D, Mohanram P (2003). Inferring the Cost of Capital Using the Ohlson – Juettner Model. *Rev. Account. Stud.* 8(4):399-431.
- Gomez-Meija LR, Nunez-Nickel M (2001). The Role of Family Ties in Agency Contracts. *Acad. Manage. J.* 44(1):81-95.
- Graham JR, Li S, Qiu J (2008). Corporate misreporting and bank loan contracting. *J. Financ. Econ.* 89(1):44-61.
- Guedhami O, Pittman JA (2006). Ownership Concentration in Privatized Firms: The Role of Disclosure Standards, Auditor Choice, and Auditing Infrastructure. *J. Account. Res.* 44(5):889-929.
- Guedhami O, Pittman JA, Saffar W (2014). Auditor choice in politically connected firms. *J. Account. Res.* 52(1):107-162.
- Gul FA, Zhou GS, Zhu XK (2013). Investor protection, firm informational problems, big n auditors, and cost of debt around the world. *Auditing* 32(3):1-30.
- Guo S, Fraser M (2010). *Propensity Score Analysis: Statistical Methods and Applications*. Thousand Oaks, CA: SAGE Publications Inc.
- Harder VS, Stuart EA, Anthony JC (2010). Propensity score techniques and the assessment of measured covariate balance to test causal associations in psychological research. *Psychol. Methods* 15(3):234-249.
- Hart SL, Sharma S (2004). Engaging fringe stakeholders for competitive image. *Acad. Manage. Exec.* 18(1):7-18.
- Heckman J (1979). Sample selection bias as a specification error. *Econometrica* 47:153-161.
- Hodgdon C, Hughes SB (2016). The effect of corporate governance, auditor choice and global activities on EU company disclosures of estimates and judgments. *J. Int. Account. Audit. Tax.* 26:28-46.
- Hope OK, Thomas WB, Kolk A (2011). Financial credibility, ownership, and financing constraints in private firms. *J. Int. Bus. Stud.* 42(7):935-957.
- Hribar P, Nichols DC (2007). The use of unsigned earnings quality measures in tests of earnings management. *J. Account. Res.* 45(5):1017-1053.
- Iacus SM, King G, Porro G (2012). Causal inference without balance checking: Coarsened exact matching. *Polit. Anal.* 20(1):1-24.
- Iatridis GE (2012). Audit quality in common-law and code-law emerging markets: Evidence on earnings conservatism, agency costs and cost of equity. *Emerg. Markets Rev.* 13(2):101-117.
- Institute of Chartered Accountants in England & Wales (2010). Regulation 30 of S.I. No.220 of 2010., Available at: <http://www.icaew.com/en/members/regu>.
- Italian Parliament (2010). Revisioni legali dei conti annuali e dei conti consolidati. Art. 2, capo II, Dlgs 39/2010, Available at: <https://www.revisiolegale.mef.gov>.
- Jenkins DS, Velury U (2011). The emergence of second-tier auditors in the post-SOX era: An analysis of accounting conservatism. *Res. Account. Regul.* 23(2):172-176.
- Johnstone KM, Bedard JC, Ettredge ML (2004). The Effect of Competitive Bidding on Engagement Planning and Pricing. *Contemp. Account. Res.* 21(1):25-53.
- Jones JJ (1991). Earnings Management During Import Relief Investigations. *J. Account. Res.* 29(2):193-228.
- Karjalainen J (2011). Audit quality and cost of debt capital for private firms: Evidence from Finland. *Int. J. Audit.* 15(1):88-108.
- Kelly AS, Mohrweis LC (1989). Bankers' and investors' perceptions of the auditor's role in financial statement reporting: The impact of SAS No. 58. *Audit – J. Practice Th.* 9(1):87-97.
- Khurana IK, Raman KK (2004). Litigation Risk and the Financial Reporting Credibility of Big 4 versus Non-Big 4 Audits: Evidence from Anglo-American Countries. *Account. Rev.* 79(2):473-495.
- Kim JB, Chung R, Firth M (2003). Auditor Conservatism, Asymmetric Monitoring, and Earnings Management. *Contemp. Account. Res.* 20(2):323-359.
- Kim JB, Simunic DA, Stein MT, Yi CH (2011). Voluntary audits and the cost of debt capital for privately held firms: Korean evidence. *Contemp. Account. Res.* 28(2):585-615.
- King G, Nielsen R, Coberley C, Pope JE (2011). Comparative Effectiveness of Matching Methods for Causal Inference. Working Paper Available at <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.230.3451>. Retrieved from <http://j.mp/jCpWmk>
- Kinney WR Jr. (1999). Auditor independence: A burdensome constraint or core value? *Account. Horizons* 13(2):69-75.
- Kleinman G, Lin BB, Palmon D (2014). Audit Quality: A Cross-National Comparison of Audit Regulatory Regimes. *J. Account. Audit. Financ.* 29(1):61-87.
- La Porta R, Lopez-De-Silanes F, Shleifer A (1999). Corporate Ownership Around the World. *J. Financ.* 54(2):471-517.
- Lai KW (2011). The cost of debt when all-equity firms raise finance: The role of investment opportunities, audit quality and debt maturity. *J. Bank. Financ.* 35(8):1931-1940.
- Lawrence A, Minutti-Meza M, Zhang P (2011). Can Big 4 versus Non-Big 4 Differences in Audit-Quality Proxies Be Attributed to Client Characteristics? *Account. Rev.* 86(1):259-286.
- Lennox C (1999). Are large auditors more accurate than small auditors? *Account. Bus. Res.* 29(3):217-227.
- Lennox C (2005). Audit quality and executive officers' affiliations with CPA firms. *J. Account. Econ.* 39:201-231.
- Lennox CS, Francis JR, Wang Z (2012). Selection Models in Accounting Research. *Account. Rev.* 87(2):589-616.
- Lennox CS, Pittman JA (2011). Voluntary audits versus mandatory audits. *Account. Rev.* 86(5):1655-1678.
- Leuz C, Nanda D, Wysocki PD (2003). Earnings management and investor protection: An international comparison. *J. Financ. Econ.* 69(3):505-527.
- Li N (2016). Performance Measures in Earnings-Based Financial Covenants in Debt Contracts. *J. Account. Res.* 54(4):1149-1186.
- Li C (2009). Does Client Importance Affect Auditor Independence at the Office Level? Empirical Evidence from Going-Concern Opinions. *Contemp. Account. Res.* 26(1):201-230.
- Li C, Xie Y, Zhou J (2010). National Level, City Level Auditor Industry Specialization and Cost of Debt. *Account. Horizons*, 24(3):395-417.
- Libby R (1979a). Bankers' and Auditors' Perceptions of the Message Communicated by the Audit Report. *J. Account. Res.* 17(1):99-122.
- Libby R (1979b). The Impact of Uncertainty Reporting on the Loan Decision. *J. Account. Res.* 17(Studies on Auditing-Selections from the "Research Opportunities in Auditing" Program):35-57.
- Lin ZJ, Liu M (2009). The impact of corporate governance on auditor choice: Evidence from China. *J. Int. Account. Audit. Tax.* 18(1):44-59.
- Lins KV, Volpin P, Wagner HF (2013). Does Family Control Matter? International Evidence from the 2008-2009 Financial Crisis. *Rev. Financ. Stud.* 26(10):2583-2619.
- Louis H (2005). Acquirers' abnormal returns and the non-Big 4 auditor clientele effect. *J. Account. Econ.* 40:75-99.
- Maijor SJ, Vanstraelen A (2006). Earnings management within Europe: the effects of member state audit environment, audit firm quality and international capital markets. *Account. Bus. Res.* 36(1):33-52.
- Mansi SA, Maxwell WF, Miller DP (2004). Does Auditor Quality and Tenure Matter to Investors? Evidence from the Bond Market. *J. Account. Res.* 42(4):755-793.
- Melumud ND, Thoman L (1990). On Auditors and the Courts in an Adverse Selection Setting. *J. Account. Res.* 28(1):77-120.
- Minnis M (2011). The Value of Financial Statement Verification in Debt Financing: Evidence from Private U.S. Firms. *J. Account. Res.* 49(2):457-506.
- Moch MK (1976). Structure and organizational resource allocation. *Admin. Sci. Quart.* 21:661-674.
- Nelson MW, Elliott JA, Tarpley RL (2002). Evidence from auditors about managers' and auditors' earnings management decisions. *Account. Rev.* 77(Supplement):175-202.
- Niemi L, Kinnunen J, Ojala H, Troberg P (2012). Drivers of voluntary audit in Finland: to be or not to be audited? *Account. Bus. Res.* 42(2):169-196.
- O'Sullivan N (1993). Auditors' Liability: Its Role in the Corporate Governance Debate. *Account. Bus. Res.* 23(1):412-420.
- Ohlson JA, Juettner-Nauroth BE (2005). Expected EPS and EPS growth as determinants of value. *Rev. Account. Stud.* 10(2-3):349-365.
- Peek E, Cuijpers R, Buijink W (2010). Creditors' and Shareholders' Reporting Demands in Public Versus Private Firms: Evidence from Europe. *Contemp. Account. Res.* 27(1):49-91.
- Petersen MA, Rajan RG (1994). The Benefits of Lending Relationships: Evidence from Small Business Data. *J. Financ.* 49(1):3-37.

- Pittman JA, Fortin S (2004). Auditor choice and the cost of debt capital for newly public firms. *J. Account. Econ.* 37(1):113-136.
- Porte DSM, Saur-Amaral I, Carlos J, Pinho DC (2015). Audit research: A systematic literature review of published research on ISI Web of Science between 2002 and 2013. *Afr. J. Bus. Manage.* 9(4):116-126.
- Power M (1997). *The Audit Society – Rituals of Verification*. Oxford: Oxford University Press.
- Prencipe A, Bar-Yosef S, Mazzola P, Pozza L (2011). Income smoothing in family-controlled companies: Evidence from Italy. *Corp. Governance*, 19(6):529-546.
- Read WJ, Rama DV, Raghunandan K (2004). Local and regional audit firms and the market for SEC audits. *Account. Horizons* 18(4):241-254.
- Reichelt KJ, Wang D (2010). National and office-specific measures of auditor industry expertise and effects on audit quality. *J. Account. Res.* 48(3):647-686.
- Reynolds JK, Francis JR (2000). Does size matter? The influence of large clients on office-level auditor reporting decisions. *J. Account. Econ.* 30(3):375-400.
- Robin A, Wu Q, Zhang H (2017). Auditor Quality and Debt Covenants. *Contemp. Account. Res.* 34(1):154-185.
- Rosenbaum PR, Rubin DB (1983). The Central Role of the Propensity Score in Observational Studies for Causal Effects. *Biometrika*, 70(1):41-55.
- Rosenbaum PR, Rubin DB (1985). Constructing a Control Group Using Multivariate Matched Sampling Methods that Incorporate the Propensity Score. *Am. Stat.* 39(1):33-38.
- Schreck P, Raithe S (2015). Corporate Social Performance, Firm Size, and Organizational Visibility: Distinct and Joint Effects on Voluntary Sustainability Reporting. *Bus. Soc.* 57(4):742-778.
- Schulze WS, Lubatkin M, Dino RN, Buchholtz AK (2001). Agency Relationships in Family Firms: Theory and Evidence. *Organ. Sci.* 12(2):99-116.
- Shipman JE, Swanquist QT, Whited RL (2015). Propensity Score Matching in Accounting Research. Working Paper, Available at: <http://ssrn.com/abstract=2392858>.
- Simunic D, Stein M (1987). Product Differentiation in Auditing: Audit firm choice in the Market for Unseasoned New Issues. The Canadian Certified General Accountants Research Foundation.
- Spirkle (2013). Auditor's liability to third parties in different countries. Essay Mode.
- Strawser JR (1994). An Investigation of the Effect of Accountant Involvement with Forecasts on the Decisions and Perceptions of Commercial Lenders. *J. Account. Audit. Financ.* 9(3):533-557.
- Sweeney AP (1994). Debt-covenant violations and managers' accounting responses. *J. Account. Econ.* 17(3):281-308.
- Teoh SH, Wong TJ (1993). Perceived Auditor Quality and the Earnings Response Coefficient. *Account. Rev.* 68(2):346-366.
- Tomczyk S (1996). Auditor reputation and initial public offerings by foreign companies. *J. Int. Account. Audit. Tax.* 5(2):249-262.
- Tsipouridou M, Spathis C (2012). Earnings management and the role of auditors in an unusual IFRS context: The case of Greece. *J. Int. Account. Audit. Tax.* 21(1):62-78.
- Van Buuren J, Koch C, Van Nieuw Amerongen N, Wright AM (2014). The use of business risk audit perspectives by non-big 4 audit firms. *Auditing: J. Pract. Th.* 33(3):105-128.
- Van Tendeloo B, Vanstraelen A (2008). Earnings Management and Audit Quality in Europe: Evidence from the Private Client Segment Market. *Eur. Account. Rev.* 17(3):447-469.
- Vander Bauwhede H, Willekens M (2004). Evidence on (the lack of) audit-quality differentiation in the private client segment of the Belgian audit market. *Eur. Account. Rev.* 13(3):501-522.
- Vander Bauwhede H, Willekens M, Gaeremynck A (2003). Audit firm size, public ownership, and firms' discretionary accruals management. *Int. J. Account.* 38(1):1-22.
- Vera-Muñoz SC, Ho JL, Chow CW (2006). Enhancing knowledge sharing in public accounting firms. *Account. Horizons* 20(2):133-155.
- Wang J, Fan NM (2014). Audit Fee Premiums: Pre and Post the Andersen Scandal and SOX. *Int. Res. J. Appl. Financ.* 5(10):1235-1260.
- Watts R, Zimmerman J (1986). *Positive Accounting Theory*. Upper Saddle City, NJ: Prentice-Hall.
- Weber J, Willenborg M (2003). Do Expert Informational Intermediaries Add Value? Evidence from Auditors in Microcap IPOs. *J. Account. Res.* 41(4):681-720.
- White H (1980). A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *Econometrica* 48(4):817-838.
- Willekens M, Simunic DA (2007). Precision in auditing standards: effects on auditor and director liability and the supply and demand for audit services. *Account. Bus. Res.* 37(3):217-232.

Appendix A (Variable definition)

Variable	Definition
Dependent variables used in cost of debt analysis	
Cost of Financial Debt	Ratio of financial expenses in year t to financial debt outstanding during the fiscal year (winsorized at the 1st and 99th percentiles)
Dependent variables used in earnings management analysis	
Francis and Wang (2008) model	<p>Absolute value of abnormal working capital accruals (winsorized at the 1st and 99th percentiles) measured as follows</p> $\text{Abnormal accruals } FW_t = (ACC_t - [WC_{t-1}/REV_{t-1} * REV_t + DEP_{t-1}/GPPE_{t-1} * GPPE_t]) / ASSET_{t-1}$ <p>ACC = (earnings before extraordinary items – cash flow from operation) / total assets at the beginning of period t</p> <p>WC = working capital as (current assets – cash and short term investment) – (current liabilities - debt in current liability)</p> <p>REV = revenues</p> <p>DEP = depreciation</p> <p>GPPE = gross property plant equipment / total assets at the beginning of the period</p> <p>ASSET = total assets</p>
Independent variables of interest	
EAF	1 if the firm is audited by a non-Big4 audit firm for which its network is also registered in the other main European countries with only private clients in Italy, specifically by Mazars/Praxity, BDO, Ria/Grant Thornton/Italaudit, Baker Tilly/Constantin Rediva/Revisa/Iter Audit, Moore and Stephen Axis/DFAudit, UHY/Moores Rowland Bompani, Crowe/Howarth/SOL, Audirevi/Nexia, AGN Serca, Prorevi/Inpact Audit, PFF, HLB/Fidital/Hazlewoods, H Audit/RSM/Kreston, BKR, Russel Bedfors, DFK, Prime Global, GGI, MGI, Morison and 0 otherwise
Independent control variables	
SIZE	Ln(total assets at the end of the fiscal year) (winsorized at the 1st and 99th percentiles)
LEVERAGE	Ratio of total liabilities to total assets at the end of the fiscal year (winsorized at the 1st and 99th percentiles)
LOSS	1 if net income is < 0 and 0 otherwise
ASSET TURNOVER	Ratio of revenues to total assets at the beginning of the fiscal year (winsorized at the 1st and 99th percentiles)
QUICK	Ratio of working capital minus inventory to short term debt at the end of the fiscal year (winsorized at the 1st and 99th percentiles)
ROA	Ratio of operating profit to total assets at the end of the fiscal year (winsorized at the 1st and 99th percentiles)
TANGIBLE	Ratio of tangible assets to total assets at the end of the fiscal year (winsorized at the 1st and 99th percentiles)
ALTMAN	Probability of bankruptcy (winsorized at the 1st and 99th percentiles) measured by Altman (1983) Z-score $(0.717 * \text{net working capital/assets} + 0.847 * \text{retained earnings/assets} + 3.107 * \text{earnings before interest and taxes/assets} + 0.42 * \text{book value of equity/liabilities} + 0.998 * \text{sales/assets})$
NEGATIVE EQUITY	1 if a company has negative equity and 0 otherwise
LOAN MATURITY	Ratio of short term debt to total debt (long + short terms) at the end of the fiscal year (winsorized at the 1st and 99th percentiles)
OWNERSHIP CONCENTR.	1 if one shareholder controls at least 75% of the company
SALES GROWTH	Percentage change in sales in the fiscal year (winsorized at the 1st and 99th percentiles)
SDCFO	Standard deviation of operating cash flow scaled by total assets at the beginning of the fiscal year (winsorized at the 1st and 99th percentiles)
CFO	Operating cash flow scaled by total assets at the beginning of the fiscal year (winsorized at the 1st and 99th percentiles)

ⁱ One reason for this regulation is that Italy is a country where the main financing channel for companies is in the form of banks and trade creditors (third parties), and creditor protection is perceived to be more important than in Anglo-American jurisdictions. Moreover, Italian auditors were originally inside internal statutory audit committees. Once it was decided that directors and members of statutory audit committee were to be made liable for damages incurred by creditors, external auditors were put in the same position as members of statutory audit committee (Giudici, 2012).

ⁱⁱ For specific effects on CoD and EQ, prior studies show that voluntary audited private firms compared to non-audited private firms have lower CoD, higher credit rating, easier access to external finance and lower EM (Minnis, 2011; Melumad and Thoman, 1990; Lennox and Pittman, 2011; Hope et al., 2011; Kim et al., 2011; Dedman et al., 2014; Dedman and Kausar, 2012; Blackwell et al., 1998; Allee and Yohn, 2009; Niemi et al., 2012; Collis, 2012). We focus on private firms that have opted for voluntary audit.

ⁱⁱⁱ For example, art. 2, capo II, regulation number 39 of 2010 in Italy (Italian Parliament, 2010); art. R. 822-19, Code de commerce in France (France Parliament, 2013); Paragraph 6 of schedule 10 of the 2006 Act in UK (Financial Reporting Council, 2006); Regulation 30 of S.I. number 220 of 2010 in Ireland (Institute of Chartered Accountants in England & Wales, 2010).

^{iv} Public firms, as Public Interest Entities, can be audited only by audit firms on the CONSOB register. Our definitions of DAF covers audit firms that are not CONSOB registered.

^v National standards are set by “Consiglio Nazionale Dottori Commercialisti ed Esperti Contabili”. ISA have been mandatory in Italy since January 1st 2015.

^{vi} In Italy, the audit of private firms can also be performed by an internal Board of Statutory Auditors or by one individual external auditor. We exclude these audits from the sample. Our sample does not include firms not audited or subject to mandatory external audit.

^{vii} We use the ATECO industry classifications following Cameran et al. 2015. This is the Italian version of the European nomenclature (NACE Rev. 2) published in the Official Journal of 20 December 2006 (European Parliament, 2006b). This classification gives these industry sectors: manufacturing activities; professional, technical and scientific services; information and communications; agriculture, forestry and fishing; minerals extraction; electric energy and gas supply; water supply and garbage disposal activities; construction activities; wholesale and retail trading; transport and storing activities; lodging and catering services; real estate; hiring services and travel agencies; entertainment and sport activities; other services.

^{viii} We select English/French speaking countries, among the European countries, and we verify the presence of the audit firms in the following registers:

1. <http://search.cro.ie/auditors/FirmSearch.aspx>,
2. <https://www.afm.nl/en/professionals/registers/alle-huidige-registers.aspx?type={B5D6C574-90DE-4E1C-A997-5D84E5086C6B}>,
3. <http://annuaire.cncc.fr/index.php?page=liste>,
4. <https://www.ibr-ire.be/fr/Rechercher/Pages/results.aspx>,
5. <http://www.cssf.lu/RegistreRevExt/>,
6. <http://www.auditregister.org.uk/Forms/Default.aspx>

^{ix} Our analysis focuses on the CoD on the banks and other financial institutions. In our sample there are no public debts.

^x Observing the data on ownership for Italian private companies, in order to have enough variation in this variable, we defined ‘closely held’ at 75%. Descriptive statistics with other cut-off points show a change of only a few companies. Most of the firms are closely held at 100%, but they are not the smallest firms.

^{xi} See Lawrence et al. (2011), Lennox et al. (2012), DeFond et al. (2016) for an explanation of the difference between this method and Heckman (1979) model, and a description of matching models. Lennox et al. (2012) suggest that future research should make exclusion restriction, putting in the main model not the same variables used in the choice model and should explain why they decide to exclude the specific variables based on theory. They also suggest to report the independent variables used in all the models, and perform sensitivity analyses. Lawrence et al. (2011) do this sensitivity analysis reporting that results are robust using probit or logit, using matching with or without replacement, using bootstrapping, kernel weighting, and random subsamples, ordinary least square, Heckman self-selection model. They also in the main model include some new independent variables or excluding some of the variables used in the choice model and give the explanation for this different inclusion/exclusion. DeFond et al. (2016) argue that limitations of PSM are related to the research design, such as the number of control firms matched to each treatment firm (one-to-one or one-to-many matching), the closeness of the match (caliper distance), the non-linear terms included in the propensity score construction, and the replacement decision. They suggest remedies repeating the analysis varying all these research design choices. In this study, we repeat the analysis with different research design choices to address these issues and following the suggestion of Lennox et al. (2012).

^{xii} All findings documented in this study are robust to using a probit model instead of a logit model to calculate propensity scores.

^{xiii} Results are the same whether we match with or without replacement, and changing the caliper distance at 0.5%. Moreover, results are the same if we switch from one-to-one to one-to-many matching. We repeat the analysis with coarsened exact matching and kernel weighting and results are also consistent with these methodologies.

^{xiv} We reviewed the following research to define the frequency of the variables used: Shipman et al. (2015), Kim et al. (2003), Weber and Willenborg (2003), Li (2009), Chang et al. (2009), Behn et al. (2008), Guedhami and Pittman (2006), Louis (2005), Pittman and Fortin (2004), Mansi et al. (2004), Johnstone et al. (2004), Fortin and Pittman (2007), Choi et al. (2008), Choi and Wong (2007), Francis et al. (1999), Chaney et al. (2004), Campa (2013), Boone et al. (2010), Eshleman and Guo (2014), Khurana and Raman (2004), Lawrence et al. (2011) and Lennox et al. (2012).

We include the most frequently used variables. We include size, as included by all the studies analyzed, because large firms are expected to raise high quality of auditors, because they are better equipped to handle the audit efficiently (Chaney et al., 2004). We include leverage because high leveraged firms tend to choose higher quality auditors to reduce their higher agency costs (e.g., Chaney et al., 2004; Fortin and Pittman, 2007). We include loss to control for profitability. We include asset turnover to control for transaction complexity because highly complex firms tend to choose high quality auditors equipped to handle the complexity (e.g., Chaney et al., 2004). We include quick ratio to control for financial risk as riskier firms tend to choose higher quality auditors with more experience and competences to audit riskier clients more efficiently (e.g., Chaney et al., 2004; Fortin and Pittman, 2007). As suggested in DeFond et al. (2016) and as done by Fortin and Pittman (2007), we control for potential nonlinearities by including both Firm Size and its square. We choose to put the nonlinear term on size, because Lennox (2005) finds that the relation between auditor choice and size is not linear.

We use some of the variables in both the choice model and in the CoD/ EM model (SIZE, LEVERAGE in CoD/EM model, QUICK in CoD model and LOSS in EM model). Following the suggestion of Lennox et al. (2012) of an exclusion restriction, we exclude asset turnover from the CoD model, given that it is not a significant determinant of interest rate. We also exclude LOSS from the CoD model, in the belief that the best CoD determinant is ROA. More complex and risk audits, identified with asset turnover and quick ratio, affect audit fees but not necessarily EM. EM is affected by other more significant determinants. Thus, we exclude quick ratio and asset turnover from the EM model. We also exclude the nonlinear term of size. We also add specific control variables that influence CoD or EM.

We do not have variables like audit hours, audit fees, audit report lag for private clients.

^{xv} Bias measures the similarity of the distributions of the first stage explanatory variables between the treatment group and the control group. It is calculated for each explanatory variable by dividing the difference in the means between the treatment and control groups by the square root of the average sample variances of the two groups (Rosenbaum and Rubin, 1985).

^{xvi} The software Stata creates a weight variable automatically. For observations in the treated group, `_weight` is 1. For observations in the control group it is the number of observations from the treated group for which the observation is a match. If the observation is not a match, weight is missing.

^{xvii} To run audit firm fixed effect, the independent variables must change across time for some substantial portion of the individuals. This is not the case in this study, because we know only the current audit firm for each client and the number of years of tenure since its engagement started, but we do not have information on the past audit firm.

^{xviii} The analysis is based on DAF because their clients-year observations are lower in number compared with EAF. We find that large firms are expected to choose high quality auditors (negative relation with DAF) because they are better equipped to handle the audit efficiently (Chaney et al., 2004). We find that high leveraged firms tend to choose higher quality auditors (negative relation with DAF) to reduce their higher agency costs (e.g., Chaney et al., 2004; Fortin and Pittman, 2007). We include loss to control for profitability.

^{xix} The economic significance is computed as follows. We take this regression coefficient and multiply it by the mean financial debts (21614) and divide it by the mean earnings before interest and taxes - EBIT (3135).

^{xx} Cost of capital in the audit literature (Khurana and Raman, 2004; Iatridis, 2012; Azizkhani et al., 2013; Cassell et al., 2013; Lawrence et al., 2011; Guedhami et al., 2014; Choi and Lee, 2014) has been measured by ex-ante cost of equity capital (for example with the models of Gebhardt et al., 2001; Claus and Thomas, 2001; Ohlson and Juettner-Nauroth, 2005; Easton, 2004; Gode and Mohanram, 2003). These models imply the use of financial analyst earnings forecasts and stock prices that are not available for private firms.

Other studies (Mansi et al., 2004; Fortin and Pittman, 2007; Li et al., 2010) measure the cost of capital with the marginal cost of debt (the yield to maturity at the issuance date for the largest bond the firm issued in year $t+1$, minus the Treasury bond yield with similar maturity) and the Standard & Poor's senior debt rating in year t . Standard & Poor's rates a firm's debt from AAA (indicating a strong capacity to pay interest and repay principal) to D (indicating actual default). Bond rates are less well-fitted in this context, given that the main source of financing is from banks and not from bondholders. In private firms, bonds are often similar to stock option and they may represent a supplement to shareholder remuneration.

The cost of total debt, measured using as denominator the amount of total debts (Pittman and Fortin, 2004; Kim et al., 2011; Lai, 2011; Minnis, 2011; Causholli and Knechel, 2012) has a mean value of about 2% with a standard deviation of 2%, similar to other countries like Korea (about 2% in Kim et al., 2011), lower than U.S. (about 7% in Minnis, 2011). In Italy, cost of total debt is much lower because it includes non-interest-bearing debt. This proxy is therefore excluded from the analysis.

^{xxi} Changing the threshold level, results are qualitatively the same.

^{xxii} The 13 DAF used here are: Aleph Auditing, Metodo, Raiffeisenverband Suedtirol Genossenschaft, Reconvi, Revi.Tor, Revind, Roberto La Lampa, Roger King, Trevor, Societa' di Revisione Contabile, Reviprof, Aure, Lombardia Revisione.

^{xxiii} Countries where the statutory auditor's liability to any third parties mainly arises from a breach of duty in tort are Belgium (De Poorter, 2008), Sweden (Spirkle, 2013), Finland, Denmark, Portugal, Greece and Luxembourg. For United Kingdom, Ireland, Netherlands, Germany, Spain, Austria liability towards third parties is subject to restrictive conditions following European Commission (2001). Other countries joining the European Union after 2004 are excluded from the analysis.