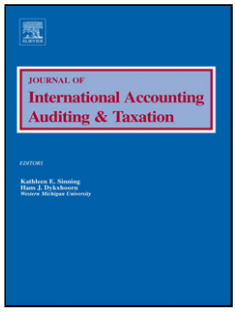

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An empirical test of SEC enforcement in the audit market

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Abstract

This paper provides evidence that the Securities and Exchange Commission's (SEC's) enforcement policies affect audit pricing. Firms with a higher probability of enforcement by the SEC are hypothesized to experience increased pricing of audit services. According to Kedia and Rajgopal (2011), geographical proximity to SEC's offices can serve as a proxy of enforcement probability. The hypothesis of the current paper is supported by the findings that audit firms charge companies with a higher enforcement probability significantly higher audit fees. Thus, audit pricing increases when auditors perceive an enhanced audit risk for firms with greater prominence on the SEC's radar. Therefore, one can infer that the probability of SEC enforcement increases the need for shareholders to bear the costs of monitoring agents and that enforcement and audit provision are complementary devices.

Keywords: SEC, audit pricing, enforcement probability, audit market.

JEL Classification: G21, G30, G34, G38, M41.

1. Introduction

Confidence in public company financial reporting is essential to the strength and vitality of markets, especially in light of the recent increasing complexity of corporate transactions and the unprecedented development of financial products and services (PCAOB, 2012; SEC, 2013). In this context, the role of oversight bodies that regulate public company financial reporting occupies a position of utmost importance (Caramanis, Dedoulis, & Leventis, 2015). Further, in the internationally influential context of the United States, the Securities and Exchange Commission's (SEC's) operation is considered important because it contributes to safeguarding the quality of financial reporting and consequently the stability of the broader economic system (Gietzmann & Pettinicchio, 2013; Karpoff, Lee, & Martin, 2008a; PCAOB, 2012; SEC, 2013). According to the commission, "taken together, the entities in the SEC's jurisdiction manage Americans' savings for college, their hopes for a secure retirement, and their reserves for a rainy day" (SEC, 2014, p. 4).

An important function of the SEC is issuing financial reporting disclosure requirements (Seetharaman, Gul, & Lynn, 2002) while also overseeing the work conducted by statutory auditors[1] with regard to SEC registrants (Hanson, 2014). DeFond, Francis, and Hallman (2015, p. 1) explain that "the SEC's mandate includes oversight of SEC registrants and their auditors, with broad powers to punish misconduct including delisting, civil fines and banning audit firms and individual auditors from the audits of SEC registrants." However, like many modern organizations preoccupied by efficiency (Ghemawat & Ricart Costa, 1993; Sathe,

[1] The SEC also oversees the work conducted by the Public Company Accounting Oversight Board (PCAOB), the body responsible for regulating auditors. In particular, the SEC appoints PCAOB members and approves aspects of its operation, including its budget and the rules and standards to be issued (Hardison & Pashkoff, 2012). The SEC Enforcement Division often takes the lead in investigations initiated by the PCAOB's Enforcement Staff (Doty, 2011; Hardison & Pashkoff, 2012).

1983) and operating under certain resource constraints, the SEC's must achieve its goals within a particular budget and according to a specific time limit (Kedia & Rajgopal, 2011). Therefore, a high probability exists that its enforcement policies are exercised on a selective basis and not "across the board" (Correia, 2012; see also Gunningham & Grabosky, 2004).

Prior empirical studies, show that, as a result of budget and time limitations, the SEC[2] is more likely to scrutinize firms that are geographically proximate to its offices compared with those that are distant because such investigations are more economical (Kedia & Rajgopal, 2011). Researchers have factored SEC enforcement activity into their analyses, revealing that these enforcement policies affect auditing practice in two ways. First, SEC enforcement action releases are associated with private civil litigation being instigated against auditors (Bonner, Palmrose, & Young, 1998); and secondly, auditors reassess client risk on the basis of SEC activity (Gietzmann & Pettinicchio, 2013).

The extant literature has established a relationship between the SEC's operations and auditing practice, but academics have paid less attention to determining whether SEC enforcement affects audit fees. Identifying whether the SEC's investigatory activity influences audit pricing is important because the level of audit fees reflects the risk and the nature, timing, and extent of relevant procedures (Bell, Landsman, & Shackelford, 2001; Bierstaker, Houston, & Wright, 2006; Cobbin, 2002). Prior studies have interpreted audit pricing as an indicator of the quality of the audit (Bierstaker, et al., 2006; Leventis, Hasan, & Dedoulis, 2013). An investigation into pricing is also valuable because a wide range of market participants,

[2] The US Chamber of Commerce and prominent former SEC commissioners, including Linda Thomsen, acknowledge the SEC's shortcomings (Thomsen, 2009; U.S. Chamber of Commerce, 2002), and the SEC enforcement director Robert Khuzami has supported the reorganization of the SEC (McKenna, 2012).

including investors, analysts, and regulators, consider audit fees to be an essential aspect of monitoring and agency cost analysis (Cobbin, 2002).

Further, such an investigation has international importance since the US context has a worldwide impact and has significantly influenced the current international financial architecture (see for instance Caramanis, et al., 2015). As a result, enforcement bodies similar to the SEC have been established across the globe, constituting key elements in the operation of the highly internationalized economy. Moreover, the SEC also has international influence because it oversees US firms that operate globally as well as foreign firms that are listed on US stock exchanges. Thus, by providing a basis for modeling the association between the SEC's impact on audit pricing, this paper invites the international readership to thoroughly investigate similar issues in other contexts, taking into consideration, however, their distinct institutional differences.

To establish whether a relationship between SEC enforcement policies and audit pricing exists, this paper employs a sample that comprises 1,252 US listed firms for an estimation window of eight years from 2003 until 2010 (i.e., a total of 10,016 firm-year observations). The reason for selecting this period is that since the introduction of the SOX framework, auditors' legal liability has increased, resulting in a higher level of penalties for audit fraud and higher audit fees (see Rashkover & Winter, 2005). Following the relevant methodology of prior literature (Kedia & Rajgopal, 2011), this paper highlights SEC enforcement probability estimated according to the geographical proximity of a firm's headquarters—that is, the central place where important business decisions are made (Leventis, Dedoulis, & Abdelsalam, 2016)—to SEC offices. Then, the paper investigates the effect of this probability on audit fees.

The findings show that firms located closer to SEC offices are charged higher fees. The results are interpreted from a resource-constraint perspective, according to which firms located in counties closer to SEC offices are more likely to be subject to the SEC's scrutiny. Therefore, auditors perceive them as having a higher audit risk, which necessitates extensive and thus more expensive audits. The current paper differs substantially from previous work. For instance, Jha and Chen (2015) only briefly consider the role of enforcement on audit pricing. They primarily focus on social capital, and they control for any confounding effects due to distance between SEC offices and firm headquarters. The current study focuses on the impact of enforcement on audit risk and analyzes how the SEC's enforcement probability, as an institutional monitoring mechanism, is associated with audit costs.

The paper makes a threefold contribution to the field. First, it extends current understanding with regard to the determinants of audit pricing. While prior literature on audit pricing has investigated variables specific to the company, audit, or both (Hay, Knechel, & Wong, 2006), this paper shows that audit fees are strongly driven by enforcement probability, which is beyond managerial or auditor control. Secondly, the findings demonstrate that SEC enforcement activity constitutes an institutional mechanism that complements auditing. This complementarity is important for the structure of regulation and for the components of a successful policy mix (Gunningham & Grabosky, 2004). Thirdly, this paper extends the overall cost-benefit analysis of regulatory enforcement, which is what interests market participants the most. While prior literature has demonstrated that the SEC's role is related to notable benefits for shareholders (see Karpoff, et al., 2008a; Karpoff, Lee, & Martin, 2008b; Kedia & Rajgopal, 2011), this paper shows that the intensity of SEC investigatory

activity is positively associated with (economically) significant costs in terms of audit pricing.

The hypothesis is developed in the next section. The data collection procedure, proxy operationalization, and the empirical model are explained in the third section. In the fourth section, the main results are discussed. Sensitivity tests are demonstrated in the fifth section, and the last section concludes the study.

2. Hypothesis development

Selznick's seminal work (Selznick, 1948) introduced the idea that any concrete organization should be *inter alia* understood as an economy,[3] that is, as a system of relationships that define the availability of scarce resources and that may be managed in terms of efficiency and effectiveness. Researchers also highlight that within the current financial system the economic function of organizations occupies an important position, and they highlight the predominance of management models that prioritize efficiency[4] (Ghemawat & Ricart Costa, 1993; Sathe, 1983). In this context, organizational performance is assessed based on whether stated goals have been achieved with the minimum expenditure of resources, that is, time and money (Rushing, 1974).

Kedia and Rajgopal (2011) employ the "constrained cop" hypothesis to argue that firms are aware of the oversight boards' operational limitations, which are chiefly attributed to enforcement budgets. For instance, in relation to the SEC, the authors argue that while the cases opened by the SEC's Enforcement Division increased by 65%, the SEC staff only grew by 27%. The authors claim that resource constraints on

[3] Selznick (1948) further underlines that organizations must also be conceptualized as adaptive social structures.

[4] However, operating efficiently does not always entail stated goals being achieved in the most appropriate manner (Sathe, 1983).

the SEC lead to enforcement decisions that are consistent with these constraints (ibid.).

Most importantly, though, Kedia and Rajgopal (2011) refer to a General Accounting Office (2007) report, which indicates that SEC officials view travelling outside their geographical jurisdiction as a significant expense that affects the efficient allocation of their investigative resources. The authors conclude that the SEC consequently tends to investigate firms headquartered based on proximity to its offices because this approach enables it to maximize the number of cases investigated and simultaneously reduce the time and budget resources consumed (Kedia & Rajgopal, 2011). The study also substantiates that information advantages grow with geographical proximity because the SEC is more likely to be knowledgeable about possible misconduct of firms located closer to its offices (ibid.). For proximate firms, interactions between the executives and the SEC could potentially lead to leaks regarding possible deviations. Additionally, the SEC relies heavily on tips about financial reporting irregularities to detect misreporters, and employees[5] of proximate firms have been demonstrated to be more likely to blow the whistle on relevant problems than employees of distant firms (Kedia & Rajgopal, 2011).

The same authors also argue that firms take note of the SEC's established pattern of enforcement activity, and therefore those headquartered closer to SEC offices are less likely to commit accounting irregularities (Kedia & Rajgopal, 2011). Following this rationale, this paper extends the previous analysis by suggesting that auditors also take note of the SEC's activity. Indeed, recent evidence suggests that elements of the broader (institutional) context affect auditor perceptions of

[5] Indeed, in the 2010 Report to the Nations the Association of Certified Fraud Examiners documents that the most common form of initial fraud detection is from a tip and, most frequently, the tip comes from a company employee (ACFE, 2010).

engagement risk and their audit procedure planning (Gietzmann & Pettinicchio, 2013; Jha & Chen, 2015). More specifically, Gietzmann and Pettinicchio (2013) maintain that, in the post-SOX era, auditors have started appreciating the regulatory risks associated with auditing clients and have in turn revised the ways that they traditionally modeled and reacted to risk. The authors demonstrate that the issuance of an SEC comment letter leads auditors to fundamentally change their perception of on-going client risk and to increase audit fees. This reaction is because the letters signal that recipient firms have appeared on the radar of the oversight board. Additionally, while primarily focusing on the effects of social capital on audit fees, Jha and Chen (2015) provide some initial evidence that a shorter distance between the SEC offices and firm headquarters drive audit fees upwards. Against a background in which auditors factor external parameters affecting engagement risk into their assessment analyses (Bedard, Deis, Curtis, & Jenkins, 2008; Colbert, Luehlfing, & Alderman, 1996; Gietzmann & Pettinicchio, 2013; see also SAS No. 109, AU Section 314: Understanding the Entity and Its Environment), auditors are very likely to take into account the SEC's tendency to prioritize the investigations of firms headquartered in counties where SEC offices are located. The auditors would thus adjust the nature, timing, and extent of audit procedures accordingly.

Auditors may judge that the more intensive investigatory role of the SEC in firms headquartered closer to its offices increases engagement risk (e.g., litigation risk; see Jha & Chen, 2015), and they may therefore devote additional time and undertake more thorough audit procedures to minimize the likelihood of misreporting. However, these more extensive audits demand adjusting audit pricing levels to reflect the additional time and effort required.

However, it cannot be ruled out that auditors may discount the SEC's ability to act as an institutional mechanism that more intensively scrutinizes firms proximate to its offices, thus contributing to minimizing financial reporting deviations. Hence, by considering that the institutional role of the SEC reduces engagement risk, auditors may revise audit procedures and reduce the time and effort devoted to auditees headquartered near SEC offices. Thus, SEC enforcement probability would operate as a substitution to auditing effort. In relation to the aforementioned rationales, the hypothesis is stated as follows:

H1: Ceteris paribus, SEC enforcement probability has an impact on the level of audit fees.

3. Research design

3.1 Data

The sample procedure started with all US publicly listed firms for which continuous fee data were available on the Audit Analytics database for 2003–2010. Data from the post-SOX era was selected because of cleaner data sets (J. R. Francis & Yu, 2009), which yielded 4,039 firms. Financial firms (1,264) were excluded because of different operations and regulations (Causholli, De Martinis, Hay, & Knechel, 2010). Next, 1,525 firms were eliminated owing to unavailability or missing data on the Compustat database and/or relocation. The final sample consisted of 1,252 firms during eight years, that is, 10,016 firm-year observations. Following McGuire, Omer, and Sharp (2012), a firm's location was defined by the location of its headquarters since corporate headquarters is the main site of managerial decision making (Porter, 2000; Rubin, 2008). Corporate headquarters was defined by the business address rather than the address of incorporation to avoid the Delaware effect (see Allen & Woodland, 2010).

3.2 Estimating enforcement probability

The SEC's investigative activities are primarily conducted by its regional offices (DeFond, et al., 2015). Each regional office reports to the director of enforcement in the SEC's national office in Washington, DC. Regional offices are central to detection, investigation, and prosecution of accounting and auditing misconduct by public companies and their auditors (ibid.). Therefore, they constitute major sources of information leading to enforcement actions. Before 2006 there were five offices representing US regions: the New York office represented the Northeast; the Chicago office represented the Midwest; the Miami office represented the Southeast; the Denver office represented the Central region; and Los Angeles represented the Pacific. Six district offices supported the work of regional offices. In particular, the district offices of Boston and Philadelphia supported the regional office of New York; Atlanta supported Miami; and Dallas-Fort Worth, Salt Lake City, and San Francisco supported Los Angeles. Various SEC sources indicate that these district offices provided only a complementary role rather than a central role in investigative and enforcement activity and relevant decision making (SEC, 2006, 2015). From 2007, the SEC elevated the six district offices to regional offices, with the aim of increasing enforcement efficiency. From that point onward, the new regional (prior district) offices played a dominant role in investigative activities, similar to the regional offices that already existed. Interestingly, the SEC's chairman, Christopher Cox, declared that "eliminating the two-tier hierarchy means that each of the Commission's offices is of equal dignity and possesses all necessary authority to protect investors and otherwise execute its responsibilities." Table 1 lists regional and district offices before and after 2006, and Figure 1 depicts the US regional offices across US states. Based on the preceding discussion and similar to prior studies

(DeFond, et al., 2015; Kedia & Rajgopal, 2011), the SEC's regional offices are considered as the main locations of SEC enforcement activity. The latitude and longitude data (obtained from the US Census Bureau's Gazetteer city-state files; see http://www.census.gov/geo/www/tiger/tigermap.html) were employed to compute the distance between each firm's headquarters and SEC office locations. The Harvershine formula (ibid.) was applied to calculate the distance in kilometers (LDIS) between two geographical points (i.e., firm location and SEC office location) as follows:

$$DIS = R * 2 * \arcsin(\min(1, \sqrt{a}))$$

Where,

R = approximately 6,378 kilometers (radius of the earth) and,

$\alpha = (\sin(dlat/2))^2 + \cos(lat1) * \cos(lat2) * (\sin(dlon/2))^2$

In the latter expression dlat = lat2 − lat1 and dlon = lon2 − lon1, where lat1 and lon1 are the latitude and longitude of firm location and lat2 and lon2 are the latitude and longitude of the SEC office location.

3.3 Control variables

Following prior studies (e.g., Causholli, et al. (2010), the control variables employed were clustered as attributes specific to client, auditor, and engagement (see section 3.3.1). Additional geographic and demographic controls were included (see section 3.3.2). Analytical explanations are detailed in prior studies (Causholli, et al., 2010; Hay, et al., 2006; Kedia & Rajgopal, 2011), and only a brief discussion is included here.

3.3.1 Client, auditor, and engagement controls

The following client-specific attributes were initially included as obtained from Compustat. The impact of corporate size (SIZE) is measured by the natural logarithm of total assets (J. R. Francis, 1984). Risk is controlled by incorporating the current ratio (CUR), beta (BETA), return on assets (ROA), loss in previous year (LOSS), and leverage (LEV). CUR proxies for liquidity, and it is measured as current assets to current liabilities (Hay, et al., 2006). LEV proxies debt contracting, and it is measured as total debt to total assets (ibid.). Causholli, et al. (2010) and Cobbin (2002) highlight the relative importance of ROA, LOSS, and BETA; therefore, these variables were included in the model. Following prior relevant studies, listing status (NYSE) and company age (AGE) were also factored into the analysis (Hay, et al., 2006). AGE is measured by the natural logarithm of the number of years of operation and NYSE by a dummy variable to denote NYSE/non-NYSE listing. Further controls were employed for organizational complexity, including the number of business segments (SEG) measured as the natural logarithm of the number of business segments (Gul & Goodwin, 2010)). Finally, litigation risk was included (LIT) and measured by a dummy variable indicating the existence/non-existence of a major federal legal proceeding under SEC regulation S-K §229.103 (see Leventis, et al., 2013).

Additionally, the following auditor- and engagement-specific attributes, which were obtained from Audit Analytics, were controlled. In this context, auditor industry specialization *inter alia* was included (J. R. Francis, Reichelt, & Wang, 2005). This proxy is operationalized as a dummy variable that takes the value 1 if the audit firm has the highest revenue in a particular two-digit SIC code category within a metropolitan statistical area (MSA), and zero otherwise, similar to McGuire, et al.

(2012). However, alternative operationalizations and cutoff points are reported in the sensitivity section. Engagement attributes were additionally controlled by including the busy season (FIS) (Leventis, et al., 2013); going-concern qualification in the audit report (GCON) (Causholli, et al., 2010); auditor change (AUDC) (Leventis, et al., 2013); financial statements restatement (RES) (DeFond, et al., 2015); and comment letters issued by the SEC (COML) (Gietzmann & Pettinicchio, 2013). All these attributes are measured as dummy variables.

3.3.2 Geographic and demographic controls

Company locations were differentiated based on being urban or rural since urban firms experience audit fee premiums (Clatworthy & Peel, 2007). Following Loughran and Schultz (2005), headquarter locations were aggregated by MSA. Based on company headquarter locations, two groups of urban firms were indicated: a) firms headquartered in one of the largest US MSAs (New York City, Los Angeles, Chicago, Washington, Baltimore, San Francisco, Philadelphia, Boston, Detroit, Dallas, or Houston) and b) firms headquartered in an MSA with at least 1 million residents, as defined by the US Census of 2010. The remaining firms were classified as rural.

Wages per county (WAGE), measured by the natural logarithm, is considered as a control of economic activity (Leventis, et al., 2016). Data were obtained from the US Bureau of Labor Statistics (http://www.bls.gov/). State judicial quality was also controlled for because it influences financial reporting decisions (Kedia and Rajgopal (2011) and thus audit pricing. Thus, similar to Kahan (2006), state judicial quality (SJQ) was operationalized by the "overall state ranking" as reported in the 2001 State Liabilities Rankings Study conducted for the U.S. Chamber of Commerce (2002) (see http://www.uschamber.com). Finally, state population (POP), measured by the natural logarithm, was included as being influential for both audit pricing and the SEC's

selection of regional offices (Kedia & Rajgopal, 2011). Relevant data were obtained from the US Census Bureau (http://www.census.gov/acs/www/).

3.4 Model specification

The hypothesis is tested by an OLS regression model of audit fees as specified, which includes the main variable of interest (enforcement) and the control variables previously discussed. Audit fees were measured by the natural logarithm (see Causholli, et al., 2010). Since audit fees are sticky over time, standard errors were clustered by audit firms using the Roger's (1993) procedure (see Numan and Willekens (2012). Thus, standard errors are adjusted for both heteroskedasticity and correlation within a cluster. Finally, the model was controlled for time and industry. The model was specified as follows:

$$\begin{aligned} AF_{ij} = {} & \alpha_o + \alpha_1 ENFORCEMENT_j + \alpha_2 SIZE_j + \alpha_3 CUR + \alpha_4 ROA_j + \alpha_5 LEV_j \\ & + \alpha_6 LOSS_j + \alpha_7 BETA_j + \alpha_8 NYSE_j + \alpha_9 LIT_j + \alpha_{10} AGE_j + \alpha_{11} SEG_j \\ & + \alpha_{12} FIS_j + \alpha_{13} GCON_j + \alpha_{14} SPEC_j + \alpha_{15} AUDC_j + \alpha_{16} COML_j \\ & + \alpha_{17} RES_j + \alpha_{18} UrAglo_j + \alpha_{19} Urban_j + \alpha_{20} WAGE_j + \alpha_{21} POP_j \\ & + \alpha_{22} JSQ_j + \sum \alpha_j YEARS_j + \sum \alpha_j INDUSTRIES_j + u_j \end{aligned} \quad (1)$$

Definitions of all variables are provided in Table 2.

4. Empirical results

Table 2: Variable Definitions

Abbreviation		Variable	Measurement	Source of data
AF	=	Audit fees	Natural logarithm of audit fees	Audit Analytics
LDIS	=	SEC office distance	Natural logarithm of the distance in kilometers between the firm and closest SEC office	US Census Bureau's Gazetteer city-state files
DIS	=	SEC office distance	Distance in kilometers between the firm and closest SEC office	US Census Bureau's Gazetteer city-state files
DIS100	=	SEC office distance	Dummy coded 1 if the distance in kilometers between the firm and closest SEC office is more than 100 kilometers, 0 otherwise	US Census Bureau's Gazetteer city-state files
SIZE	=	Company size	Natural logarithm of total assets	Compustat
CUR	=	Liquidity	Current assets to total assets	Compustat
ROA	=	Profitability	Return on total assets	Compustat
LEV	=	Leverage	Long-term debt to total assets	Compustat
LOSS	=	Loss in prior year	Dummy coded 1 if a firm's net income in prior year is < 0, 0 otherwise	Compustat
BETA	=	Market risk	Relationship between stock volatility and the market volatility	Compustat
NYSE	=	Listing status	Dummy coded 1 if a firm is listed on the NYSE, 0 otherwise	Compustat
LIT	=	Litigation	Dummy coded 1 if a firm has material legal proceedings, 0 otherwise	Audit Analytics
AGE	=	Company age	Natural logarithm of company age	Compustat
SEG	=	Number of business segments	Natural logarithm of number of business segments	Compustat
FIS	=	Fiscal year end	Dummy coded 1 if fiscal year end is in December, 0 otherwise	Compustat
GCON	=	Going-concern qualification	Dummy coded 1 if a firm has a going-concern qualification, 0 otherwise	Compustat
SPEC	=	Auditor specialization	Dummy coded 1 if the audit firm owns the largest fee market share in an audit market, 0 otherwise. An audit market is defined as a two-digit SIC industry within an MSA.	Audit Analytics
AUDC	=	Auditor change	Dummy coded 1 if the auditor changed compared to prior year, 0 otherwise	Audit Analytics
COML	=	Comment letters	Dummy coded 1 if a firm has received a comment letter, 0 otherwise	Audit Analytics

RES	=	Financial statement restatements	Dummy coded 1 if there is a financial statement restatement, 0 otherwise	Audit Analytics
UrAglo	=	Urban agglomeration firm	Dummy coded 1 if a firm is headquartered in one of the largest US MSAs (New York City, Los Angeles, Chicago, Washington, Baltimore, San Francisco, Philadelphia, Boston, Detroit, Dallas or Houston), 0 otherwise	US Census Bureau
Urban	=	Urban firm	Dummy coded 1 if a firm is headquartered in in an MSA with at least 1 million residents as defined by the US Census of 2010, 0 otherwise	US Census Bureau
WAGE	=	County wages	Natural logarithm of average wage per county	US Bureau of Labor Statistics
POP	=	County population	Natural logarithm of population per county	US Census Bureau
SJQ	=	State judicial quality	Dummy coded 1 if corporate headquarters belong to the 10 states with the worst judicial quality based on the US Chamber of Commerce, 0 otherwise	US Chamber of Commerce

Table3 presents the descriptive statistics of the variables employed. All continuous variables were winsorized at the 1st and 99th percentiles of their respective distributions to reduce the effect of outliers. The mean (median) of the dependent variable is 13.88 (13.96), similar to prior studies (see Leventis, et al., 2013). The mean (median) of LDIS is 4.93 (5.59), which corresponds with a distance of approximately 351 (267) kilometers.

Table 4 presents the Pearson correlations tests between the regression variables. AF (audit fees) are significantly correlated with LDIS, DIS, and DIS100 with a negative sign. Almost all variables are significantly correlated with AF, with SIZE exhibiting the highest p-value. Based on other inferences, multicollinearity is not a serious problem (Gujarati, 2004). The data suggest that enforcement probability is more likely in firms that are large in size and profitable, listed on the NYSE, and located in urban areas. The data also suggest that firms that are more likely to provoke SEC enforcement report fewer restatements and more comment letters, supporting Kedia and Rajgopal (2011).

The regression results are reported in

Table. All regression models are significant, with explanatory powers of around 86%. The coefficients of enforcement measures are negative and significant at the 1% level.

The regression coefficients of the control variables are remarkably consistent with the expected signs based on prior research. Specifically, SIZE, profitability (ROA, LOSS), complexity (SEG), and risk (BETA, LEV, NYSE, LIT) are all significantly associated with audit fees (similar to Causholli, et al., 2010; Hay, et al., 2006). LEV is significant with a negative sign, tentatively suggesting that creditors carry out a monitoring role, which verifies (Jensen & Meckling, 1976). Additionally, difficulties related to audit engagements, as indicated by the significance of FIS, RES, and AUDC, are significant in the determination of audit pricing (similar to Hay, et al., 2006). The negative coefficient of AUDC might indicate low-balling; that is, whether audit fee discounts are offered in initial engagements for client attraction, followed by fee recovery in the future while the client is retained (DeAngelo, 1981). This possibility requires further investigation. The coefficients of geographic and demographic variables are in line with expectations, and they are economically meaningful. Overall, the findings support prior studies and demonstrate that audit fees are determined by characteristics related to client, auditor, and audit-engagement. However, the findings also suggest that previously developed audit pricing models (e.g., Causholli, et al., 2010) should additionally consider the probability of enforcement action.

5. Sensitivity analysis

The robustness of the findings was examined in various ways. First, numerous variables found to be influential for audit fees, but not tested in the main model owing to data and/or specification reasons, were sensitivity tested. These include non-audit fees (Hay, et al., 2006); membership of the Fortune 500 index (Leventis, et al., 2016); research and development to turnover (R&D) (Gul & Goodwin, 2010); membership of a high-incentive industry (ibid.); foreign sales; IPO; and audit lag (Cobbin, 2002). Additionally, following Vafeas and Waegelein (2007), variations of corporate governance were also controlled. To this end, an aggregate governance measure was employed (Audit Integrity's accounting and governance risk [AGR] proxy developed by GMI [www.gmiratings.com]), which has been found to be superior in comparison with other conventional measures (see Price, Sharp, & Wood, 2011). The impact of product market competition (PMC) was also tested (Leventis, Weetman, & Caramanis, 2011), as proxied by the Herfindahl-Hirschman index (H-index) similar to Leventis, et al. (2016). The incorporation of these variables does not change the inferences. Furthermore, auditor assessment of internal controls efficiency (IC) and shareholder activism (SA) (Gul & Goodwin, 2010) were tested using data obtained from Audit Analytics. The results show that both IC and SA increase audit pricing (significant at the 1% level), probably due to the increased audit risk, while the LDIS coefficient remains significant at the 1% level.

Second, additional controls related to demography and geography were considered. Thus, educational attainment (EDU), defined as the percentage of people in the state who are 25 years or older and have a bachelor's degree (Beck, Francis, & Gunn, 2013), was included. Again, inferences remain unchanged. In addition, corporate headquartering in states that have implemented the 150-hour (R150) education requirement were controlled, since this factor has been suggested to

influence audit pricing (Allen & Woodland, 2010). Indeed, the R150 control is significant at 1%, while LDIS remains significant at 1%. To test the sensitivity of WAGE as a proxy of geographical economic activity, two additional metrics were further included: a) average household income per county (INC) measured by the natural logarithm (B. Francis, Hasan, John, & Waisman, 2016), with data obtained from the US Census Bureau (http://www.census.gov/acs/www/), and b) cost of living (COST) for every county in the sample based on data collected from Sperling's cost of living index calculator (http://www.bestplaces.net/col/), similar to B. Francis, et al. (2016). All controls are significant at 1%, while the enforcement variables are significant at 1%.

Third, given that SEC offices are located in urban areas, the sensitivity of urban proxies was tested in two ways: a) the model was run to include only firms located in urban areas (i.e., firms closer to SEC offices), and b) interaction effects between enforcement and urban variables were introduced, and the model was run again. In both cases the enforcement variables remain significant at 1% and 5%, similar to the results reported by the main model.

Fourth, regarding concerns in the current literature about determining and operationalizing the audit expertise proxy (Fung, Gul, & Krishnan, 2012), auditor expertise was redefined at national, state, and county levels, and the models were run again. Additionally, the models were run again, including auditor specialization operationalized at different cutoff points. Specifically, specialization was considered when an audit firm controls at least 25% (or 30%) of the market share in a two-digit SIC industry, similar to Leventis, et al. (2016). In terms of enforcement significance levels, results remain unchanged.

Fifth, whether the immediate post-SOX period (2003–2005) had any profound impact on audit fees in comparison to later years (2008–2010) was further tested. The results for these periods are similar.

Sixth, further testing was done on whether reverse causality or omitted variables (i.e., endogeneity) provide serious biases to the parsimony of the model. Audit pricing is unlikely to affect the SEC's choice of office location or a company's decision to change headquarters since both relocate very rarely (see Kedia & Rajgopal, 2011; Pirinsky & Qinghai, 2006). So, the LDIS variable is regarded as exogenous to audit pricing. Thus, to preserve the parsimony of the model, geographical variables correlated to both LDIS and audit fees are considered.

The impact of political norms (POL) in geographical areas (Rubin, 2008) was also examined because it was previously reported as having a significant effect on financial (Kaustia & Torstila, 2011), accounting (Dyreng, Mayew, & Williams, 2012), and audit outcomes (Leventis, et al., 2016). $POL_{j,t}$ was operationalized through a dummy coded 1, where election results favor Republican candidates, and 0, where the election results favor Democratic candidates, in a county (*j*) where firms are headquartered in year (*t*). When POL was tested the results remain unchanged.

The effect of audit quality was also examined since Kedia and Rajgopal (2011) suggest that enforcement probability influences audit quality. Academically developed proxies (Dechow, Sloan, & Sweeney, 1995; Kothari, Leone, & Wasley, 2005; Roychowdhury, 2006) and Audit Integrity's accounting risk (AR) measure (developed by GMI and employed in prior literature (e.g. McGuire, et al., 2012)) were tested. However, the results remain unchanged.

The impact of ownership structure was also examined since previous literature indicated that it warrants consideration (Khalil, Magnan, & Cohen, 2008). Ivkovic

and Weisbenner (2005) suggest that companies located in urban areas might share particular characteristics in terms of ownership structure. Therefore, institutional and insider ownership were considered, similar to Leventis, et al. (2016). The results remain similar. Finally, a median regression (minimizing the sum of absolute errors instead of squared errors) was run to further ensure that the results are not driven by outliers. The LDIS coefficient remained significant at 1%.

6. Conclusions

The SEC plays a vital role in safeguarding the credibility of financial reporting. This oversight board's investigatory role constitutes an essential institutional mechanism that reduces accounting irregularities and enhances accountability and transparency in financial reporting. However, SEC enforcement activity is subject to a shortage of budgetary and time resources. Prior literature has established that SEC enforcement activity follows a fairly well-established pattern: the SEC is more likely to investigate firms that are headquartered closer to its offices, a policy that allocates the commission's limited resources more efficiently (Kedia & Rajgopal, 2011). Against this background, this paper examines whether the SEC's enforcement pattern affects audit fees, the level of which is often related to the quality of financial reporting and therefore interests a wide range of market participants.

On the basis of the findings, this paper argues that auditors factor SEC activity into their risk-assessment analyses. In particular, auditors understand that geographical proximity to the oversight board's offices entails a higher engagement risk, and they therefore charge higher fees to firms headquartered closer to SEC offices. Thus, auditors employ a pricing policy that reflects their increased effort to minimize the likelihood of misreporting, which would in turn expose the auditor to an SEC investigation.

The contribution of this paper is substantial since it extends current understanding about the determinants of audit fees. It reveals that audit pricing is strongly driven by the probability of oversight board enforcement, a parameter that lies beyond managerial or auditor control. Moreover, the paper demonstrates that the SEC's operation is complementary to auditing. Additionally, this paper extends the overall cost-benefit analysis of regulatory enforcement by revealing that the intensity of the SEC's investigatory activity is associated with significant costs in terms of audit pricing.

The implications of the paper are important for investors, analysts, professionals, and regulators. First, the results provide insights into how agency and monitoring costs differ in relation to SEC enforcement activity. Secondly, the findings assist market participants in understanding how the SEC's institutional role is complementary to auditing and, therefore, that improved financial reporting quality is related to higher costs for both shareholders and tax payers. Thirdly, by illuminating the complementary relationship between SEC investigations and auditors' work, and in particular showing that the SEC's investigatory pattern leads auditors to increase their audit effort, which is reflected in the increased audit fees, this paper enables regulators to understand the necessity of reorganizing enforcement or establishing alternative governance mechanisms and, at the same time, to place emphasis on firms that are not proximate to SEC offices.

The study has a number of limitations, and these may inspire future research. First, the findings are country specific and cannot be generalized. Hence, future research could explore audit-pricing behavior in other contexts characterized by strong or weak enforcement programs. Second, the results refer to nonfinancial firms and therefore cannot be extended to highly regulated industries including banks and

insurance firms. Future researchers could advance current understanding by focusing on the financial sector. Our analysis and results suggest that the impact of urban agglomeration on audit matters requires further investigation. This investigation could include audit pricing as well as issues related to auditors' decisions considering risk and effort. Finally, although this type of research provides inferences based on statistical analysis, future research could extend current knowledge by employing behavioral and organizational frameworks to make sense of auditor attitudes with regard to pricing policies and enforcement probability.

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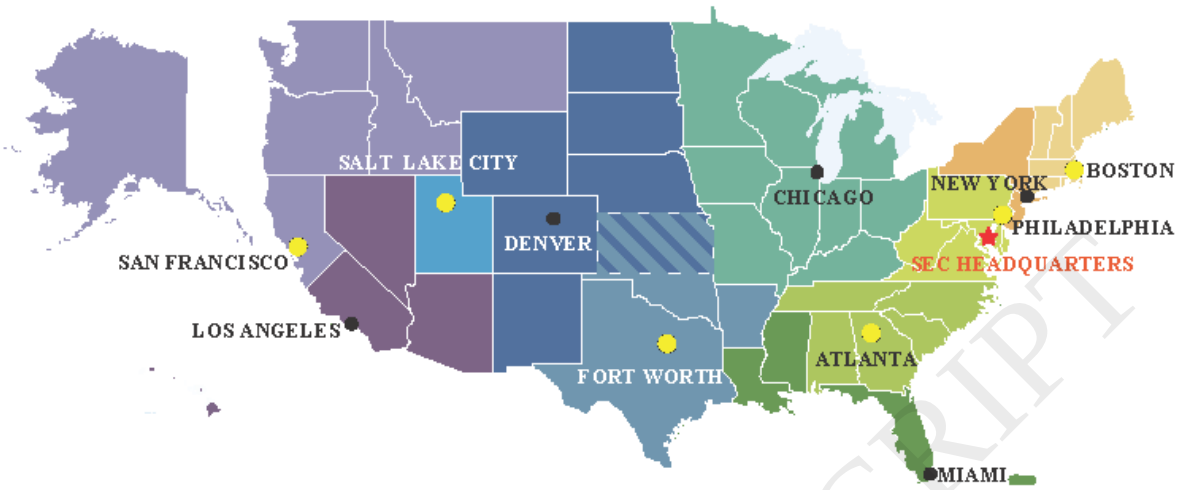
Figure 1: SEC Regional Offices across the US



Note: In black dots are the SEC offices before 2007, while the SEC offices in yellow opened after 2007. Colors in US states indicate the specific jurisdiction areas of the SEC offices.

Table 1: SEC Regional Offices and Jurisdictions

Region	SEC Offices before 2007		SEC Offices after 2007	States in Regional Jurisdiction
	SEC Regional Offices	SEC District Offices	SEC Regional Offices	
Northeast	New York	Boston, Philadelphia	New York, Boston, Philadelphia	Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, West Virginia
Midwest	Chicago		Chicago	Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, Ohio, Wisconsin
Southeast	Miami	Atlanta	Miami, Atlanta	Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee
Central	Denver	Dallas-Fort Worth, Salt Lake City	Denver, Dallas-Fort Worth, Salt Lake City	Arkansas, Colorado, Kansas, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, Wyoming
Pacific	Los Angeles	San Francisco	Los Angeles, San Francisco	Alaska, Arizona, California, Hawaii, Idaho, Montana, Nevada, Oregon, Washington

Table 2: Variable Definitions

Abbreviation		Variable	Measurement	Source of data
AF	=	Audit fees	Natural logarithm of audit fees	Audit Analytics
LDIS	=	SEC office distance	Natural logarithm of the distance in kilometers between the firm and closest SEC office	US Census Bureau's Gazetteer city-state files
DIS	=	SEC office distance	Distance in kilometers between the firm and closest SEC office	US Census Bureau's Gazetteer city-state files
DIS100	=	SEC office distance	Dummy coded 1 if the distance in kilometers between the firm and closest SEC office is more than 100 kilometers, 0 otherwise	US Census Bureau's Gazetteer city-state files
SIZE	=	Company size	Natural logarithm of total assets	Compustat
CUR	=	Liquidity	Current assets to total assets	Compustat
ROA	=	Profitability	Return on total assets	Compustat
LEV	=	Leverage	Long-term debt to total assets	Compustat
LOSS	=	Loss in prior year	Dummy coded 1 if a firm's net income in prior year is < 0, 0 otherwise	Compustat
BETA	=	Market risk	Relationship between stock volatility and the market volatility	Compustat
NYSE	=	Listing status	Dummy coded 1 if a firm is listed on the NYSE, 0 otherwise	Compustat
LIT	=	Litigation	Dummy coded 1 if a firm has material legal proceedings, 0 otherwise	Audit Analytics
AGE	=	Company age	Natural logarithm of company age	Compustat
SEG	=	Number of business segments	Natural logarithm of number of business segments	Compustat
FIS	=	Fiscal year end	Dummy coded 1 if fiscal year end is in December, 0 otherwise	Compustat
GCON	=	Going-concern qualification	Dummy coded 1 if a firm has a going-concern qualification, 0 otherwise	Compustat
SPEC	=	Auditor specialization	Dummy coded 1 if the audit firm owns the largest fee market share in an audit market, 0 otherwise. An audit market is defined as a two-digit SIC industry within an MSA.	Audit Analytics
AUDC	=	Auditor change	Dummy coded 1 if the auditor changed compared to prior year, 0 otherwise	Audit Analytics
COML	=	Comment letters	Dummy coded 1 if a firm has received a comment letter, 0 otherwise	Audit Analytics

RES	=	Financial statement restatements	Dummy coded 1 if there is a financial statement restatement, 0 otherwise	Audit Analytics
UrAglo	=	Urban agglomeration firm	Dummy coded 1 if a firm is headquartered in one of the largest US MSAs (New York City, Los Angeles, Chicago, Washington, Baltimore, San Francisco, Philadelphia, Boston, Detroit, Dallas or Houston), 0 otherwise	US Census Bureau
Urban	=	Urban firm	Dummy coded 1 if a firm is headquartered in in an MSA with at least 1 million residents as defined by the US Census of 2010, 0 otherwise	US Census Bureau
WAGE	=	County wages	Natural logarithm of average wage per county	US Bureau of Labor Statistics
POP	=	County population	Natural logarithm of population per county	US Census Bureau
SJQ	=	State judicial quality	Dummy coded 1 if corporate headquarters belong to the 10 states with the worst judicial quality based on the US Chamber of Commerce, 0 otherwise	US Chamber of Commerce

Table 3: Descriptive Statistics

	N	Mean	StDev	Min	Median	Max
Dependent Variable						
AF	10,016	13.88	1.38	8.55	13.96	17.74
AF in $ (,000)	10,016	2,559.00	4,192.00	5.20	1,164.00	83,334.00
Independent Variables						
LDIS	10,016	4.93	1.87	-9.26[6]	5.59	9.38
DIS	10,016	351.35	515.84	0.694	267.74	1547.78
DIS100	10,016	.629	.483	0	1	1
Control Variables						
SIZE	10,016	6.59	2.21	3.75	6.77	12.61
CUR	10,016	2.11	1.39	.006	1.79	14.40
ROA(%)	10,016	3.08	10.18	-49.90	4.579	48.92
LEV(%)	10,016	25.69	19.46	1.01	22.92	148.85
LOSS	10,016	.238	.426	0	0	1
BETA	10,016	1.31	.785	.19	1.26	8.94
NYSE	10,016	.523	.499	0	1	1
LIT	10,016	.212	.408	0	0	1
AGE	10,016	3.21	.864	0	3.13	5.26
SEG	10,016	.755	.702	0	.895	2.30
FIS	10,016	.645	.478	0	1	1
GCON	10,016	.026	.159	0	0	1
SPEC	10,016	.050	.219	0	0	1
AUDC	10,016	.063	.243	0	0	1
COML	10,016	.374	.484	0	0	1
RES	10,016	.138	.345	0	0	1
UrAglo	10,016	.407	.491	0	0	1
Urban	10,016	.367	.482	0	0	1
WAGE	10,016	10.75	.251	9.95	10.74	11.52
POP	10,016	16.10	.842	8.92	13.09	17.43
SJQ	10,016	.277	.447	0	0	1

[6] The negative value of some logarithms is due to the distance of some firms of less than 1 kilometer from the SEC offices which is represented in decimals fractions of the kilometer.

Table 4: Pearson Correlation Matrix between AF, LDIS, DIS, DIS100, and Control Variables (*n = 10,016*)

VAR	AF	LDIS	DIS	DIS100	SIZE	CUR	ROA	LEV	LOSS	BETA	NYSE	LIT	AGE	SEG	FIS	GCON	SPEC	AUDC	COML	RES	UA	U	WAGE	POP
LDIS	-.09*	1.000																						
DIS	-.08*	.55*	1.000																					
DIS100	-.08*	.77*	.47*	1.000																				
SIZE	.88*	-.04*	.04*	-.01	1.000																			
CUR	-.15*	.01	-.04*	-.04*	-.17*	1.000																		
ROA	.16*	.01	.02*	.02*	.24*	.02*	1.000																	
LEV	-.01	-.01	.01	.01	.04*	-.26*	-.15*	1.000																
LOSS	-.21*	-.01	-.01	-.03*	-.31*	.01	-.57*	.15*	1.000															
BETA	.08*	.04*	.01	.02*	.04*	.03*	-.14*	.06*	.12*	1.000														
NYSE	.56*	-.03*	.08*	.04*	.61*	-.18*	.18*	.05*	-.23*	.05*	1.000													
LIT	.37*	-.02*	-.02*	-.02*	.38*	-.08*	.06*	-.02*	-.05*	-.01	.19*	1.000												
AGE	.21*	-.01	-.05*	.01	.20*	-.01	.11*	-.10*	-.12*	-.06*	.18*	.06*	1.000											
SEG	.41*	-.01	-.05*	.01	.35*	-.08*	.06*	-.01	-.10*	-.01	.29*	.11*	.20*	1.000										
FIS	.08*	-.06*	-.03*	-.03*	.06*	-.04*	-.01	.12*	.01	.02*	.09*	.01	-.08*	.11*	1.000									
GCON	-.25*	.01	.01	-.01	-.32*	-.13*	-.20*	.09*	.24*	-.03*	-.14*	-.04*	-.04*	-.09*	.01	1.000								
SPEC	.22*	-.04*	-.02*	-.04*	.23*	-.06*	.01	.01	-.01	.03*	.15*	.13*	-.01	.08*	.03*	-.02*	1.000							
AUDC	-.18*	-.01	-.01	-.01	-.19*	.02*	-.08*	.01	.08*	-.01	-.12*	-.05*	-.04*	-.06*	-.01	.08*	-.05*	1.000						
COML	.20*	-.08*	-.09*	-.08*	.16*	-.03*	-.01	.01*	.02*	.01	.06*	.05*	.07*	.09*	.04*	-.02*	.04*	.01	1.000					
RES	.06*	.03*	.03*	.01*	-.07*	-.01	-.04*	-.01	.03*	.01	-.03*	-.01	-.05*	-.02*	.01	.01	.01	.04*	-.05*	1.000				
UrAglo	.08*	-.38*	-.1	-.54*	.04*	.01	.01	-.0	.01	-.03*	.09*	.03*	-.0	.01	.07*	.01	.06*	.02*	.02*	-.01	1.000			

			8*					5*					8*											
Urban	.01	.21*	.10*	.33*	.01	-.02*	.01	.01	-.01	.02*	-.04*	.01	.04*	-.01	-.07*	-.03*	-.01	-.03*	-.01	-.01	-.61*	1.000		
WAGE	.27*	-.42*	-.08*	-.47*	.17*	.01	-.01	-.04*	.03*	.02*	.06*	.10*	.02*	.05*	.02*	-.04*	.10*	-.01	.18*	-.06*	.39*	-.05*	1.000	
POP	.09*	-.14*	-.07*	-.29*	.04*	-.04*	-.03*	-.09*	.04*	.04*	.01	.03*	-.09*	-.02*	.02*	-.02	.05*	.01	.04*	-.01	.36*	-.01	.28*	1.000
SJQ	.01	.06*	.14*	-.06*	.01	.03*	-.01	-.03*	.02*	.03*	-.03*	.01	-.10*	-.08*	.01	.02*	.01	.01	-.01	.01	.18*	-.08*	.08*	.33*

* Statistically significant at the 5% level or higher (two-tailed test).

Table 5: Audit Fee and Enforcement Measures

Variables	Exp. Sign	LDIS	DIS100	DIS
(Constant)		5.43***	5.42***	5.70***
Enforcement	-	-.011***	-.049***	-.001***
SIZE	+	.531***	.531***	.535***
CUR	-	-.034***	-.035***	-.018*
ROA	-	-.004***	-.004***	-.003***
LEV	+/-	-.001**	-.001**	-.001***
LOSS	+	.086***	.086***	.067***
BETA	+/-	.070***	.069***	.069***
NYSE	+	.078**	.080***	.083**
LIT	+	.088***	.086***	.055***
AGE	-	.001	.001	-.001
SEG	+	.169***	.165***	.158***
FIS	+	.063***	.063***	.001
GCON	+	.021	.020	.052
SPEC	+	.171***	.167***	.134***
AUDC	+/-	-.101***	-.100***	-.127***
COML	+	-.007	-.006	.001
RES	+	.073***	.072***	.043***
UrAglo	+	.062**	.057**	.092**
Urban	+	.052***	.055***	.063***
WAGE	+	.259***	.256***	.261***
POP	?	.049***	.050***	.034
SJQ	+/-	.023***	.014	.060***
Industry dummies		included	included	included
Year dummies		included	included	included
N		10,016	10,016	10,016
Adj R^2		85.67	85.67	86.65

*, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively (two-tailed).