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The Effect of Audit Quality on Idiosyncratic Return Volatility

ABSTRACT: In this paper, we find that high quality audits have the effect of concentrating firm-specific information and investors' price response to the information during financial statement release periods and diluting them at other periods. As a result, we find that firms audited by higher quality auditors exhibit lower idiosyncratic return volatility. Our findings are based on a sample of 51,559 firm-year observations for 8,261 U.S. firms spanning the period from 2000 to 2010. In further analysis, we show that the effect of audit quality on idiosyncratic return volatility is incremental to the effect of accruals quality. Our findings are robust to alternative measures of audit quality and idiosyncratic return volatility, as well as to endogeneity issues. Taken together, our findings suggest that audit quality is valued by investors and used in their pricing decisions.

Keywords: *Idiosyncratic Return Volatility; Information Asymmetry; Audit Quality.*

Data Availability: *Data are available from sources identified in the text*.

I. INTRODUCTION

In this paper we investigate the relation between audit quality and idiosyncratic return volatility. In particular, we examine whether clients audited by higher quality auditors (proxied by auditor office size) are associated with lower idiosyncratic return volatility. We contend that audit quality influences the information flow pattern from the firm to the investors. By improving investor confidence and the reliability of financial reports, higher audit quality accentuates information flow and investor price response at times of financial reporting while diluting them in periods between the financial reports.[1] Based on the argument that idiosyncratic stock return volatility reflects the flow of firm-specific information, we hypothesize that the idiosyncratic return volatility is lower for firms whose financial statements are subject to higher audit quality than for firms whose financial statements are subject to lower audit quality. By the same token, we also expect the idiosyncratic return volatility in firms with higher audit quality to be more concentrated at periods of financial reports.

In the absence of firm-specific information, investors can only respond to market-wide information and therefore, the firm's stock can only follow market movements.[2] However, firm-specific information could cause the firm's stock price to deviate from market movements, i.e., result in idiosyncratic price movements. In effect, each day's idiosyncratic stock movements capture that day's firm specific information released into the market. When financial statements are scrutinized by a high quality auditor, a greater part of the firm-specific news flows into the market during the financial reporting period.[3] This increases the idiosyncratic price movement at

[1] We describe this effect in greater detail later in this section.

[2] We assume that stock price changes are caused by price-relevant information. In the absence of firm-specific information, only market information is available to investors and therefore the firm's stock price changes reflect market movements. Firm-specific price-relevant information that is not deducible from the market could move the stock price differently from the market movement.

[3] Even though the auditor *only reviews* quarterly financial statements, when a high quality audit process (including scrutiny at the time of review) is in place, the reliability of quarterly financial statements and investors' confidence in them increases and this

the time of financial reporting but reduces it during intervals between financial reports. In effect, high audit quality will have the effect of reducing the information contained in the daily news releases.[4] This gets reflected in two observable effects. First, in comparison with a similar firm with lower audit quality, we expect less average idiosyncratic stock price movements for a firm with higher audit quality. Second, we expect the concentration of firm-specific information at the time of earnings announcements to be more pronounced when audit quality is higher. The second effect can be empirically measured by the ratio of the idiosyncratic return volatility during earnings announcement periods to the idiosyncratic return volatility during other periods. We test these two propositions in this paper.

In a recent paper, Rajgopal and Venkatachalam (2011) show that lower accruals quality is associated with higher idiosyncratic return volatility. We expand on their theme in this paper. Higher audit quality, apart from improving accruals quality, is also likely to improve the quality of other disclosures by managers. Further, higher audit quality increases investor confidence through the attestation of financial statements backed up by a clean, independent opinion. Relative to low quality auditors, the seal of approval by a high quality independent auditor can reassure investors that financial statements are less error-prone for at least two reasons. First, more errors are likely to be detected and second, higher quality auditors use lower materiality thresholds in forcing managers to correct them.[5] In effect, audit quality affects investor confidence through improving the accruals quality and through other mechanisms such as

could result in concentrated stock price movements during the quarterly earnings announcements with relatively less scope for unanticipated surprises and stock price movements during the rest of the time.

[4] We assume that the *total* firm-specific information that becomes available to investors over period of time (say, a year) is not affected by audit quality. The main effect of a high audit quality is to shift more of the information to the preceding financial statement and, in effect, leave a smaller residual amount of information that is released on a day-to-day basis. Investors benefit from high audit quality because more information becomes available earlier in a timely fashion, making such information more valuable.

[5] There is extensive empirical research on materiality summarized by Holstrum and Messier (1982) and Messier et al. (2005).

improved disclosure and certification. Consequently, investors could better infer information quality if they supplement accruals quality with audit quality.[6]

Higher quality auditors deploy more resources and knowledge than low quality auditors to identify the appropriateness of accounting procedures and detect accounting misestimates, errors and irregularities; implement lower materiality thresholds and permit lower tolerance for the errors that are detected; and exhibit greater independence by not yielding to firm managers in negotiating the required revisions.[7] Financial statements that undergo such rigorous scrutiny are more transparent which, in turn, affects a myriad of value-relevant factors, including contracting efficiency, legal enforcement and regulatory incentives.[8] In particular, when financial statements provide value-relevant firm-specific information more reliably, they incorporate a larger proportion of the prospective information about the firm with less measurement error and this correspondingly reduces the extent of news (unanticipated surprises) at times other than the financial statement release period.

In addition, attestation of financial reports by higher quality auditors, increase investors' confidence by reassuring them that the reporting is more transparent. Therefore, when the audit quality is higher, we expect the price response to earnings to be higher, both because of the improvement in accruals quality and higher investor confidence in the attestation. By the same token, higher audit quality reduces unanticipated surprises (and the corresponding stock price

[6] We present supporting literature in the next section about the confidence-boosting effect of certification by a high quality third party certifying agency or through brand reputation documented in both finance and marketing literatures.

[7] This argument follows DeAngelo (1981) who defines audit quality in terms of finding an accounting failure (knowledge and competence) and reporting it (independence).

[8] Financial statements are employed for writing compensation, debt and other contracts. Lack of reliability in those numbers renders contracts less efficient. Further, legal proceedings often use accounting numbers; the efficacy of such proceedings could suffer if the quality of information released in financial statements is not good. Likewise, regulations are often written and implemented using accounting numbers, and unreliable accounting numbers could result in reduced efficiency both in the formulation and enforcement of regulations and contracts.

responses) at other times, thereby reducing the idiosyncratic return volatility of stock returns over most of the year (other than in the periods when financial reports are released).[9]

For two similar firms with different audit qualities but with similar news over the year, we expect the one with higher audit quality to show more pronounced firm-specific stock movements during financial statement periods and less pronounced firm-specific stock movements during other times compared to the firm with lower audit quality. The average stock return volatility over the year is therefore likely to be lower for the firm with higher audit quality. Further, the ratio of idiosyncratic return volatility during financial statement release period to idiosyncratic return volatility during the remaining period will be higher for firms with higher audit quality. We empirically show these effects in this paper.

We also show that investors use audit quality incrementally over accruals quality in their pricing responses. In particular, we show that when accruals quality is poor (good) investors give greater (less) weight to audit quality. By showing that audit quality influences the idiosyncratic return volatility of the client firm's stock returns, we demonstrate the value of auditors as financial intermediaries who help in reducing the information differences between the firms and their investors (Healy and Palepu 2001).

Consistent with recent empirical evidence, we use auditor office size as our measure of audit quality after controlling for the national auditor size.[10] Based on Simunic (1980), prior audit

[9] This argument focuses on an individual firm rather than on the cross-section of firms. However, the cross-sectional results would be appropriate if there is no systematic negative association between the total information released and audit quality. In other words, if higher audit quality is associated with lower total information flow, then even a larger part of the lower total flow could be lower in a cross sectional analysis than a smaller part of larger total information flow. However, a negative association is very unlikely because larger firms are known to have more information and are generally audited by larger offices of the Big 4 auditors (higher audit quality). Further, our ratio tests show that the ratio of idiosyncratic return volatility during financial report release periods to other periods is higher in firms with higher audit quality.

[10] The audit market is characterized by a differentiated oligopoly in which the "Big N" auditors form an oligopoly and are differentiated from a large number of smaller audit firms in a price-competitive market. Based on the analysis in Sutton (1991) and Sirios and Simunic (2011), the differential manifests itself in the form of investments in quality. At the firm level, this theory predicts very little difference in quality among the Big N auditors and similarly, little difference in quality among the non-Big N auditors. Given that more than 90% of the market capitalization in the U.S. is in firms that are audited by the Big N, this differentiation between Big N and non-Big N is not an effective quality measure. The observable difference in quality among the

research has until recently used the size of the auditing firm at the national level as the only measure of audit quality. However, as Big N auditors have similar independence and competence levels at the national level, and audit more than 90% of the firms, the binary variable denoting either Big N or non-Big N is at best a coarse measure of audit quality.[11] Within the Big N, the resources and expertise (determinants of competence) vary widely among offices of different sizes.

Audit quality is dependent on the expertise and resources deployed in the audit engagement (Sirois and Simunic 2011). A larger office with more employees can garner more technical resources and have access to greater expertise than a smaller office belonging to the same national audit firm. Moreover, larger offices can bring to the audit engagement a richer collective experience in administering audits of public companies (Francis and Yu 2009).[12] These arguments suggest that a larger office of the auditor is more equipped to provide higher audit quality than a smaller office of the same auditor (Francis 2004).

We establish several new results. First, using a sample of 51,559 firm-year observations for 8,261 U.S. firms we document a significant negative relation between auditor office size and idiosyncratic return volatility. Second, we compute the ratio of idiosyncratic return volatility during the financial statement release periods over idiosyncratic return volatility during the remaining periods of the year and show that this ratio is higher for firms with higher audit quality. Third, we show that the effect of audit quality on idiosyncratic return volatility is incremental to the effect of accruals quality. We further show that accruals quality and audit quality play substitutive roles in reducing idiosyncratic return volatility. Our findings are robust to alternative

audits conducted by the big4 auditors therefore arises from the difference in the office sizes.

[11] Big N auditing firms in our sample consist of Arthur Andersen, Deloitte and Touche, Ernst and Young, KPMG, and PricewaterhouseCoopers. Arthur Andersen was removed from the Big N group after its collapse in 2001.

[12] We also note that the independence levels of different offices, even if they belong to the same national level auditor, are nevertheless different. An engagement partner at a small office that services a few clients is likely to be marginally more accommodative of a client's request than an engagement partner in a large office that services many clients.

measures of audit quality and idiosyncratic return volatility. We address the omitted variable problem by running random- and fixed-effect panel regressions. In addition, the possibility of reverse causality is addressed by running a two-stage least-squares regression model. Our main findings hold.

We contribute to the auditing literature by showing that audit quality is a valuable input to investors in pricing the client firm's equity. To the best of our knowledge, we are the first to investigate the relation between audit quality and idiosyncratic return volatility. While Rajgopal and Venkatachalam (2011) show that accruals quality is negatively associated with idiosyncratic return volatility, we go a step further by controlling for accruals quality in our tests. We show that the effect of audit quality on idiosyncratic return volatility is incremental to the effect of accruals quality. There are two reasons why we expect this result. First, audit quality affects not only the accruals and the earnings but several other accounting numbers that have incremental information over earnings. Second, investors derive greater confidence in the accounting numbers through the certification effect of financial statements by high quality auditors. Our finding suggests that investors value each of these measures of information environment more when the other measure is poor.

The remainder of the paper is structured as follows. Section II discusses prior literature and develops the testable hypothesis. Section III describes the data and the variables used in the study. Section IV presents the empirical results and the robustness checks and section V concludes.

II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Audit Quality and Idiosyncratic Return Volatility

Accounting and Other Information in Investment Decisions

A primary purpose of the accounting and the auditing systems is to provide timely value-relevant information to better inform the investors in their investment decision. This is acknowledged by the Financial Accounting Standards Board (FASB) in their concept statements.[13]

SFAC No. 8 (OB6 Chapter 1, page 2) indicates that financial statement provides only part of the information needed by investors in their investment decisions.[14] By implication, better accounting and auditing systems should increase the firm-specific value-relevant prospective information provided through financial statements and other sources. Investors supplement the financial statement information with the information contained in other news released by the firm, informed traders, analysts or others to the market. An important difference between financial statement information and other information is that the former is released periodically on a quarterly basis whereas other information can arrive at any time. When the accounting and auditing system is good, a greater proportion of the information is received at specific points in time (i.e., the earnings announcement dates) and a lower proportion of the information comes over the rest of the period through non-accounting sources.

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[13] The Statement of Financial Accounting Concepts (SFAC) No. 8 (FASB, 2010) states that the objective of general purpose financial reporting is "to provide financial information about the reporting entity that is useful to existing and potential investors, lenders and other creditors in making decisions about providing resources to the entity" (OB2, chapter 1, page 1); and "to help them assess the prospects for future net cash inflows to an entity" (OB3, chapter 1, page 1). OB5 (Chapter 1, page 2), states "many existing and potential investors, lenders and other creditors must rely on general purpose financial reports for much of the financial information they need and OB6 (Chapter 1, page 2) alludes to the substitution between the prospective information given by the financial statements and the prospective information that is made available outside of the system by the firm or other market players.

[14] It states "general purpose financial reports do not and cannot provide all the information that existing and potential investors, lenders and other creditors need. Those users need to consider pertinent information from other sources, for example, general economic conditions and expectations, political events and political climate and industry and company outlooks".

Information Quality and Idiosyncratic Return Volatility

Financial disclosures reduce information asymmetry between informed and uninformed investors (Diamond and Verrecchia 1991; Healy et al. 1999). By increasing the quantity and improving the quality of financial statement disclosures, auditing plays a role in reducing information asymmetry. Prior literature has linked idiosyncratic return volatility with information quality in different ways.

Pastor and Veronesi (2003) develop a model where investors take time to learn about a firm's profitability. For new firms where there is insufficient time for this learning to occur and for small firms that disclose less information than large firms, investors' assessments of the profits are likely to be less precise. In Pastor and Veronesi (2003), firms with greater uncertainty in valuation have higher idiosyncratic risk. More recently, Rajgopal and Venkatachalam (2011) find that the increase in idiosyncratic risk as documented in Campbell et al. (2001) is attributable to deteriorating accruals quality. Similarly, Chen et al. (2012) show that firms with poorer information quality exhibit higher idiosyncratic return volatility. Specifically, they find that the upward trend in idiosyncratic return volatility is attributable to the deteriorating information quality reflected by discretionary accruals volatility. In summary, prior studies support the following ideas: (i) idiosyncratic price responses are associated with information releases; (ii) periodic and infrequent information releases such as financial statements result in price responses in short intervals and have less effect on average idiosyncratic return volatility compared to continuous "leakage" of information on a daily basis; and therefore, (iii) better financial reporting reduces idiosyncratic return volatility but private information collection by informed traders could increase idiosyncratic return volatility.

Importance of Idiosyncratic Return Volatility to Investors

Even though higher audit quality reduces idiosyncratic return volatility, it could be argued that auditors do not add overall value because idiosyncratic return volatility could be diversified by investors. This argument of irrelevance of firm-specific information has been negated by several recent studies in the finance literature that have highlighted the importance of idiosyncratic return volatility to investors. In a seminal paper, Merton (1987) shows that if investors have limited access to information, they cannot fully diversify firm-specific risk and therefore demand higher return from stocks with high idiosyncratic return volatility. King et al. (1994), document that idiosyncratic return volatility is priced.

Campbell et al. (2001) document a doubling of firm-level variance during the last three decades, even though market and industry variances have remained stable. They argue that the increase in firm-level variance is consequential to investors for two reasons. First, the higher idiosyncratic risk could reflect lower correlations between stocks, implying that more securities are required to form well-diversified portfolios. As a result, investors will either incur higher transaction costs in forming larger portfolios or remain under-diversified while facing greater idiosyncratic risk. In the latter case, they will demand a higher premium for stocks of firms with higher idiosyncratic risk. Second, if idiosyncratic risk is itself a priced risk factor the increase in idiosyncratic return volatility directly affects investors' portfolio and hedging strategies. To the extent that idiosyncratic return volatility is priced, investors demand higher premium for stocks with higher idiosyncratic risk (Easley and O'Hara 2004; Pastor and Veronesi 2003). The implication of these findings is that over the last few decades, the increase in idiosyncratic return volatility has been costly for investors.

Goyal and Santa-Clara (2003) document a significant positive relation between idiosyncratic risk and the firm's return on the market. Spiegel and Wang (2005) show that stock returns increase with the level of idiosyncratic return volatility and firms with high idiosyncratic return volatility are those with the least liquidity. Malkiel and Xu (2006) state that when one group of investors, who they call "constrained" investors, are unable to hold the market portfolio, the remaining investors ("unconstrained investors") are also unable to hold the market portfolio. Brandt et al. (2010), show that the idiosyncratic return volatility phenomenon is more pronounced in firms with low share prices and confirm a link between retail trading behaviour and idiosyncratic return volatility.

Fink et al. (2010), show that the increase in idiosyncratic return volatility can be explained by a dramatic increase in the number of new listings and a simultaneous decline in the age of the firm at initial public offering. Chen et al. (2012), document that managerial discretion in accruals drives the variation in idiosyncratic return volatility through its influence on information quality. More specifically, they find that firms with poorer information quality have higher idiosyncratic return volatility. In light of these findings, if idiosyncratic return volatility is priced, investors will require a higher rate of return to invest in firms with lower audit quality.

Audit Office Size as a measure of Audit Quality

Simunic (1980) and DeAngelo (1981) motivate the use of the size of the audit firm to measure audit quality because of two related reasons: larger audit firms are less dependent financially on any single client than smaller firms and could therefore exhibit greater independence; and because larger audit firms have more to lose if an audit failure is revealed

ex-post, it is in their interest to provide a higher quality audit.[15] Moreover, larger auditors invest more long-term fixed resources in the audit process and therefore develop competence and knowledge that smaller auditors cannot match. Several studies (Francis 2004; Lennox 1999; DeFond et al. 2000) have shown positive relation between auditor size and alternative proxies of audit quality. Prior studies have also shown that the larger auditors command an audit fee premium (Palmrose 1988; Ireland and Lennox 2002), which is possible in equilibrium because they can provide higher audit quality.

However, we argue that the audit firm size at the national level is a coarse measure of audit quality. There is little difference in size among the four big audit firms compared to the difference between the Big N and non-Big N auditors. The market value of the firms in the U.S. audited by the Big N auditors constitutes more than 90% of the total market value of listed firms (GAO 2008 reports that 98% of firms with revenue over a billion dollars were audited by the Big N auditors). In effect, the audit firm size at the national level cannot differentiate quality differences in the audits of most listed firms in the U.S. Therefore, we seek finer measures of audit quality.

Prior research (Wallman, 1996; Francis, 2004; Francis and Yu, 2009; and Choi et al. 2010), shows that the size of individual offices is a finer proxy for quality (auditor independence) than the size of the auditor at the national level because most audit decisions related to a specific client are made at the office handling the audit, rather than at the national audit firm level. The competence and resources available at the national level within the firm are likely to be more accessible at large offices. In effect, large offices have greater collective human capital, and greater "in-house" experience and expertise in dealing with public companies (Francis 2004;

[15] Larger auditors face higher litigation risk than smaller auditors in case of audit failure – both the probability of lawsuits and the compensation demanded - because of "deeper pockets". Furthermore, larger auditors are likely to have more reputation capital that would be jeopardized if an audit failure is exposed either through the media or/and through lawsuits.

Francis and Yu 2009). Danos et al. (1989) note that a larger office typically has wider client base, provides the auditors with more opportunities to interact with different clients, has more peers to consult with and has a stronger local support network. The wider client base also allows the engagement partners in larger offices to exhibit greater independence than those in smaller offices with very few clients. Empirically, using office size as the proxy for audit quality, Francis and Yu (2009) examine the effect of audit quality on abnormal accruals, likelihood of meeting or beating earnings benchmarks and the likelihood of an auditor giving qualified opinion to a distressed firm. Their results show that clients audited by larger offices have smaller abnormal accruals, are less likely to meet or beat earnings benchmarks and are more likely to issue going concern reports. They find that office size remains a significant determinant of audit quality after controlling for industry expertise, audit tenure and other firm-specific characteristics. Consistent with these arguments, we use auditor office size as the primary measure of audit quality.

Audit Quality and Certification Effect

Abdel-Khalik and Solomon (1988) argue that financial statements are likely to provide more confidence to investors if they are certified by a high-quality auditor than by a low quality auditor. The attestation (i.e., the seal of approval) by a higher quality auditor gives greater confidence to market participants in the financial statement numbers than when they are attested by a lower quality auditor. Between two firms that have the same accruals quality (i.e., the ability to predict future cash flows) investors are likely to place higher weight on the earnings of the firm whose accruals have passed through the scrutiny of a higher quality auditor. Effectively, the investor infers the quality of earnings by the quality of the certifying auditor. Higher quality auditors bring more resources and knowledge to the audit and act more independently by having

a higher threshold of reliability for certification than lower quality auditors.[16] It therefore stands to reason that investors should distinguish between the certification by high and low quality auditors in relying on the reported financial statement numbers. There is empirical support for this argument. Teoh and Wong (1993) show that larger auditors generate more precise earnings than smaller auditors. Therefore, their certification provides greater credibility.

The value of certification by a high quality auditor is conceptually similar to the "brand value" that has been studied extensively in marketing. An audit office that consistently performs higher quality audits develops a reputation for quality that is akin to having a superior "brand" than a similar certification by an audit office that lacks similar reputation for quality.[17] In marketing, brand value has attracted considerable interest and is defined as an added value that the brand gives to the product (Farquhar 1989; Cobb-Walgren et al. 1995). Brands get value because customers have greater confidence in branded products than in unbranded products, thereby increasing customer loyalty and allowing for price premium. In our context, capital market participants are the consumers of the financial statement information (the product) which comes in different 'brands' depending on the size of the audit office certifying the statements. The brand value translates to the additional investor confidence arising from the certification by a high-quality auditor.

[16] Financial statements of all listed firms are certified by auditors as following GAAP. However, a higher quality auditor requires a greater adherence to the letter and spirit of accounting standards, has a greater likelihood of discovering more errors, has less tolerance for errors and uses a lower materiality threshold than a lower quality auditor. In effect, a higher quality auditor holds the management to a higher standard of reporting than a lower quality auditor does. This difference might not be readily discernible in the accruals quality or other outcome-based measures. But the fact that a higher quality auditor has certified the financial statements provides greater credibility in the quality of earnings to the investors than when a lower quality auditor certifies the same financial statements.

[17] The brand value of auditors is driven mostly by the quality of audit services they provide. One can view the brand value of an auditor as consisting of two brand components. The first is the brand value of the auditor at the national level. In the differentiated oligopoly audit market, the brand value of the big-4 auditors is vastly higher than for other auditors but there is very little brand value difference among the big 4 auditors. The second component of the brand value is at the office level. It is here that certain offices of the big 4 auditors can differentiate themselves from other offices of the same or another big 4 firm. Typically, larger offices with more in-house knowledge and experience with a wider client base can establish a reputation for consistently good audit quality and differentiate themselves from smaller offices that cannot match the in-house resources.

Hypotheses Development

We have argued that higher audit quality incentivizes managers to improve the accrual quality of the financial statements. By holding the managers to a higher standard in compliance with GAAP, certification by higher quality auditors improves investor confidence. Put simply, audit quality affects idiosyncratic return volatility by improving both accrual quality and investor confidence. This increase in investor confidence in financial statement information will make investors: (i) collect less costly firm-specific information; and (ii) place less weight on the private information they actually collect. The lower weight placed on private information reduces the price impact of the firm-specific information flowing into the market between earnings announcements, which in turn reduces the idiosyncratic return volatility. Based on this discussion we state our first hypothesis in two parts.

Hypothesis 1a: Idiosyncratic return volatility is lower for firms with higher audit quality.

Hypothesis 1b: The ratio of idiosyncratic return volatility during earnings announcement periods to other periods is higher for firms with higher audit quality.

Our second hypothesis focuses on how audit quality and accruals quality interact with each other. Audit quality and accruals quality are both observable signals of the underlying information environment. The relative weights that investors place on these signals, in aggregating the information in the signals are proportional to their signal-to-noise ratio (Banker and Datar, 1989). In effect when the accruals quality is not very informative, investors place more weight on audit quality. On the other hand, when the accruals quality is informative, they place less weight on audit quality. Based on this discussion we state our second hypothesis in two parts.

Hypothesis 2a: The negative relation between audit quality and idiosyncratic return volatility is stronger in firms with lower accruals quality.

Hypothesis 2b: The positive relation between audit quality and the ratio of idiosyncratic return volatility during earnings announcement periods to other periods is stronger in firms with lower accruals quality.

III. DATA AND VARIABLES

Sample

We obtain the data for this study from three sources. The data on the auditor practice office that provides auditing services to each firm is obtained from the Audit Analytics database. Firm financial information is obtained from Compustat and stock returns from CRSP. Our initial sample consists of all firm-year observations (125,365) in the Audit Analytics database spanning the period 2000-2010. We drop 19,355 observations from our sample due to the lack of financial information in Compustat and a further 17,452 observations due to the lack of stock return information in CRSP. We require each observation to have non-missing values for all the variables in the idiosyncratic return volatility regression and this filtering rule further reduces our sample size by 36,999 observations. Our final sample contains 51,559 firm-year observations for 8,261 unique firms.[18] Further, we winsorize each variable at both the upper and lower one-percentile levels to mitigate the effect of extreme observations.

Variable Measurement

Idiosyncratic Return Volatility

We measure idiosyncratic return volatility (*VAR*) as the variance of the regression residuals from the Fama and French three-factor model. The measure is calculated as follows. We first estimate the regression of a firm's daily excess return against the excess market return (*RMRFT*),

[18] For robustness purposes, we conduct our analysis on the subsample of firms audited by Big N auditors to determine whether our findings are driven by institutional differences between Big N and non-Big N auditors. Our results hold.

SMB and HML each year.[19] We then compute the variance of the residuals from the regression for each firm-year observation and employ the results as our measure of idiosyncratic return volatility. To be included in our sample, we require each firm to have at least 120 days of stock return data. For ease of interpretation, we multiply the original variance by 1,000 and use the scaled value in the analysis. We define earnings announcement volatility ratio (*EAV*), as the ratio of the idiosyncratic return volatility computed over the four quarterly earnings announcement periods (i.e., event days [-3,+1] around each earnings announcement), divided by the idiosyncratic return volatility computed over all the other days during the year. We obtain the earnings announcement dates from I/B/E/S.

We also employ three alternative measures of idiosyncratic return volatility for robustness check purposes: (i) the variance of the regression residuals from the market model using value-weighted market returns; (ii) the variance of the regression residuals from the market model using equal-weighted market returns; and (iii) the variance of the regression residuals from the Carhart four-factor model. Correspondingly, we define alternative earnings announcement volatility ratios using the idiosyncratic return volatility estimates from the three models.

Audit Quality

We employ auditor office size as our primary measure of audit quality. Following Francis and Yu (2009), we define auditor office size (*OFC*) as the natural logarithm of the annual aggregate audit fees (in millions of U.S. dollars) that the firm's auditor practice office collects from all its clients who are included in the Audit Analytics database. This is our primary measure

[19]We obtain RMRFT, SMB, HML and MOM from Kenneth French's website at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

of auditor office size. Francis and Yu (2009) state that since audit fees are directly related to engagement hours, offices with higher fees are likely to have had more hours of audit experience. We also employ two alternative definitions of auditor office size for robustness check purposes. In our first alternative measure we define auditor office size as the natural logarithm of aggregate total fees (audit plus non-audit fees). However, Francis and Yu (2009) note that audit and total fees can be influenced by client attributes such as size, risk and complexity whereas the number of clients is free of such effects. Hence, we employ the natural logarithm of the number of clients in the auditor practice office as our second alternative measure of auditor office size.

In addition to auditor office size, we also employ auditor industry specialization (*SPEC*) as an alternative measure of audit quality. DeFond et al. (2000) contend that audit quality is primarily determined by the industry specialization of the audit firms. This finding is likely due to industry specialist auditors having more knowledge and competence than non-specialist auditors. Industry specialization increases the possibility that auditors will detect misrepresentations in the client's financial statements, thus enhancing audit quality (Krishnan 2003; Gul et al. 2009). We follow Gul et al. (2009) and define auditor industry specialization as a dummy variable indicating whether the auditor has the largest market share in the firm's two-digit SIC industry. We measure auditor market share by aggregate client assets and aggregate client sales, respectively.

Other Variables

Consistent with Rajagopal and Venkatachalam (2011), we measure accruals quality using the DD measure (*DD*) and abnormal accruals (*ABACC*). We follow McNichols (2002) and Francis et al. (2005) and use the modified version of the DD measure initially proposed by Dechow and

Dichev (2002). Abnormal accruals are defined as the square of the abnormal accruals computed using the performance-adjusted modified Jones (1991) model specified in Kothari et al. (2005). In general, higher values of the DD measure and abnormal accruals indicate lower accruals quality.

We follow Gul et al. (2011) and Rajgopal and Venkatachalam (2011) and include the following firm characteristics as control variables in the regression. Return on equity (*ROE*) is the ratio of operating income to the book value of equity. *ROE* volatility (*VROE*) is defined as the standard deviation of *ROE* over the previous three years. Leverage (*LEV*) is the ratio of long-term debt over book value of assets. Market-to-book (*MB*) is the ratio of market value of equity over book value of equity. Firm size (*SIZE*) is the natural logarithm of book value of assets. Dividend dummy (*DDIV*) is a dummy variable equal to one if the firm pays dividends and zero otherwise. Firm age (*AGE*) is the natural logarithm of the number of years the firm has existed in the CRSP database. Diversification (*DIVER*) is a dummy variable equal to one if the firm has more than one business segment and zero otherwise. Mergers and acquisitions (*MERG*) is a dummy variable equal to one if the firm is involved in mergers and acquisitions and zero otherwise. Stock return (*RET*) is the cumulative annual stock return.

We further control for two important auditor-related variables to ensure that our findings are not influenced by omitted auditor variables. Our first auditor-related variable is Big N dummy (*BIGN*), a dummy variable equal to one if the firm is audited by a Big N auditor and zero otherwise. Johnson et al. (2002), Myers et al. (2003) and Ghosh and Moon (2005), document that earnings quality increases with tenure. In addition, Francis and Yu (2009) control for auditor tenure in their models to confirm that the office size results are not due to an omitted auditor

tenure variable. Consistent with their findings, we control for auditor tenure (*TNR*), defined as the natural logarithm of the number of years the firm has retained its current auditor.

Descriptive Statistics

Table 1 presents the summary statistics of the variables. The table shows that the mean values of idiosyncratic return volatility and earnings announcement volatility ratio are 1.568 and 2.076, respectively. The table also shows that the mean auditor office size is 2.544. Of the firms in our sample, 74.3% are audited by Big N auditors and the average auditor tenure is 1.9. The table also shows that the mean return on equity is -3.5% while the median is 7.7%, suggesting that the negative mean return on equity is driven by firm years with big losses. The average ROE volatility is 0.518. The mean leverage ratio of our sample firms is 0.171 and the mean market-to-book ratio is 2.581. The average firm size and firm age are 6.29 and 2.384, respectively. 41.2% of the sample firms pay dividends; the proportion of firms with more than one business segment is 36.6%; 16.5% of the firms are involved in mergers and acquisitions over the year; and the average one-year stock return is 15.7%.

(Insert Table 1 about here)

Table 2 presents the sample Pearson and Spearman rank correlations between the variables. The lower-left part shows the Pearson correlation matrix and the upper-right part shows the Spearman correlation matrix. The first column (Pearson correlation) shows that idiosyncratic return volatility is negatively correlated with earnings announcement volatility ratio, auditor office size, Big N dummy, auditor tenure, return on equity, leverage, market-to-book ratio, firm size, dividend dummy, firm age, diversification, mergers and acquisitions dummy and stock returns, and positively correlated with *ROE* volatility. The first row (Spearman correlation) yields similar results. Further, the second column (Pearson correlation) shows that earnings

announcement volatility ratio is positively correlated with auditor office size, Big N dummy, auditor tenure, return on equity, market-to-book ratio, and dividend dummy, while negatively correlated with *ROE* volatility, leverage, and dividend dummy. The first and second row (Spearman correlation) yield similar results.

(Insert Table 2 about here)

IV. EMPIRICAL RESULTS

Relation between Audit Quality and Idiosyncratic Return Volatility

We estimate the following pooled ordinary least squares regression specification to test that higher audit quality is associated with lower idiosyncratic return volatility (Hypothesis 1a).

$$\begin{aligned} VAR_{it} = \beta_0 + \beta_1 OFC_{it} + \beta_2 BIGN_{it} + \beta_3 TNR_{it} + \beta_4 ROE_{it} + \beta_5 VROE_{it} \\ + \beta_6 LEV_{it} + \beta_7 MB_{it} + \beta_8 SIZE_{it} + \beta_9 DDIV_{it} + \beta_{10} AGE_{it} \\ + \beta_{11} DIVER_{it} + \beta_{12} MERG_{it} + \beta_{13} RET_{it} + Yr + Ind + \varepsilon_{it} \end{aligned} \quad (1)$$

In this model, *i* denotes firm, *t* denotes year, *Yr* is year fixed effects, *Ind* is industry fixed-effects based on two-digit SIC codes and ε is the error term. The *t*-statistics are computed using standard errors corrected for both serial correlation and heteroskedasticity. The regression results are presented in column (1) of Table 3. The column shows that the coefficient of auditor office size is negative and statistically significant. This finding supports Hypothesis (1a), which states that there is a negative relation between audit quality and idiosyncratic return volatility. We note that the effect is incremental to the Big N and auditor tenure effects.

Consistent with our expectations, we find that both the Big N dummy and auditor tenure exhibit significant negative relation with idiosyncratic return volatility, suggesting that firms audited by large auditors and those that retain their auditor for longer periods enjoy lower

idiosyncratic return volatility. In conjunction with the Rajgopal and Venkatachalam (2011) result that higher earnings quality is associated with lower idiosyncratic return volatility, these findings are consistent with prior studies, which find that clients audited by Big N auditors exhibit higher earnings quality (e.g., DeAngelo 1981; Becker et al. 1998; Francis et al. 1999; Nelson et al. 2002; and Behn et al. 2008). These findings are also in line with prior literature which shows that auditors with longer tenure are associated with higher audit quality (e.g., Johnson et al. 2002; Myers et al. 2003; and Ghosh and Moon 2005). Idiosyncratic return volatility is negatively related to return on equity and positively related to ROE volatility, suggesting that profitable firms have lower idiosyncratic risk while firms with higher operating risk have higher idiosyncratic risk. We also document that old firms, dividend-paying firms, firms with lower leverage ratio or larger size and firms involved in mergers and acquisitions tend to have lower idiosyncratic return volatility. We do not find a significant relation between idiosyncratic return volatility and market-to-book ratio, diversification or stock return. These results are also largely consistent with prior studies (Gul et al. 2011; and Rajgopal and Venkatachalam (2011)).

Relation between Audit Quality and Earnings Announcement Volatility Ratio

We estimate a similar model as Eq. (1) to test that the ratio of idiosyncratic return volatility during earnings announcement periods to other periods is higher for firms with higher audit quality (Hypothesis 1b).

$$\begin{aligned} EAV_{it} = \beta_0 + \beta_1 OFC_{it} + \beta_2 BIGN_{it} + \beta_3 TNR_{it} + \beta_4 ROE_{it} + \beta_5 VROE_{it} \\ + \beta_6 LEV_{it} + \beta_7 MB_{it} + \beta_8 SIZE_{it} + \beta_9 DDIV_{it} + \beta_{10} AGE_{it} \\ + \beta_{11} DIVER_{it} + \beta_{12} MERG_{it} + \beta_{13} RET_{it} + Yr + Ind + \varepsilon_{it} \end{aligned} \quad (2)$$

In this model, *i* denotes firm, *t* denotes year, *Yr* is year fixed effects, *Ind* is industry fixed-effects based on two-digit SIC codes and ε is the error term. The *t*-statistics are computed using standard errors corrected for both serial correlation and heteroskedasticity. The regression results are presented in column (2) of Table 3. Column (2) shows that the coefficient of auditor office size is positive and highly significant. The results are consistent with Hypothesis (1b) that there is a positive relation between audit quality and earnings announcement volatility ratio.

We find that Big N auditors and auditors with longer tenure have higher earnings announcement volatility ratio. The findings suggest that firms audited by Big N auditors and those that retain their auditor for longer periods have lower price impact of the firm-specific information flowing into the market between earnings announcements. The findings further confirm the argument that Big N auditors and auditors with longer tenure are associated with higher earnings quality. The earnings announcement volatility ratio is also positively related to return on equity and negatively related to ROE volatility. Further, we document that larger firms, dividend-paying firms, firms with lower leverage, firms involved in mergers and acquisitions, and firms with low stock return have higher earnings announcement volatility ratio. No significant relation is found for market-to-book and diversification.

(Insert Table 3 about here)

Controlling for Accruals Quality

Rajgopal and Venkatachalam (2011), show that lower accruals quality is associated with higher idiosyncratic return volatility. If the only channel through which audit quality affects idiosyncratic return volatility is by improving the quality of accruals, our findings with regard to the relation between audit quality and idiosyncratic return volatility should no longer hold once we control for accruals quality. However, if there are other channels through which audit quality

affects idiosyncratic return volatility (in particular, the certification/attestation effect), our findings should hold even after controlling for accruals quality in the regression.

To address this issue we first replicate the tests in Rajgopal and Venkatachalam (2011) using the DD measure and present the results in column (1) of Table 4. Column (1) shows that the DD measure is positively and significantly related to idiosyncratic return volatility. This finding is consistent with Rajgopal and Venkatachalam (2011), who show that lower accruals quality is associated with higher idiosyncratic return volatility. In column (2), we run the same regression for the earnings announcement volatility ratio and find that the DD measure is negatively and significantly associated with the earnings announcement volatility ratio. The finding suggests that firms with lower accruals quality have higher price impact of the firm-specific information flowing into the market between earnings announcements.

Next, we examine whether our results for audit quality hold after controlling for accruals quality. We present the regression results in columns (3) and (4) of Table 4. We show that after controlling for accruals quality, our measure of audit quality (i.e., auditor office size) is negatively and significantly associated with idiosyncratic return volatility and the earnings announcement volatility ratio, suggesting that the effect of audit quality on the two measures is independent of accruals quality.

In addition to controlling for accruals quality, we also investigate the interaction between audit quality and accruals quality. We present the results in columns (5) and (6) of Table 4. Our results show that the interaction between audit quality and the DD measure is negative and significant in the idiosyncratic return volatility regression and positive and significant in the earnings announcement volatility ratio regression. These findings suggest that the effects of accruals quality on idiosyncratic return volatility and the earnings announcement volatility ratio

are weaker when the firm has higher audit quality. This finding is consistent with Hypotheses (2a) and (2b), respectively.[20]

(Insert Table 4 about here)

Robustness Checks

Alternative Measures

In this section, we report on several robustness checks that validate our main results. For the sake of brevity, we only report the coefficient of audit quality. Panel A of Table 5 presents the results from regressing idiosyncratic return volatility (Column 1) and earnings announcement volatility ratio (Column 2) on auditor office size using three alternative models of idiosyncratic return volatility, namely, the value-weighted market model, the equal-weighted market model, and the Carhart four-factor model. We find that the coefficient of auditor office size is negatively and significantly related to idiosyncratic return volatility, while being positively and significantly related to the earnings announcement volatility ratio. This shows that our findings are robust to alternative measures of idiosyncratic return volatility.

Panel B of Table 5 presents the results from regressing idiosyncratic return volatility on alternative definitions of audit quality, namely, auditor office size by total fees, auditor office size by number of clients, auditor industry specialization by client assets, and auditor industry specialization by client sales. We find that the coefficient of auditor quality is negatively and significantly related to idiosyncratic return volatility, while being positively and significantly related to the earnings announcement volatility ratio. This shows that our findings are robust to alternative measures of audit quality.

[20] For the sake of brevity, the results for abnormal accruals (ABACC) are not tabulated but are qualitatively the same.

Omitted Variables

One of the potential endogeneity problems in our main analysis is that of correlated omitted variables. The observed relation between idiosyncratic return volatility and auditor office size could be driven by their correlation with variables that are not included in our model. Though we have included several auditor and firm characteristics and year and industry fixed effects in our model, we still cannot rule out the effect of omitted variables. We address this problem by conducting random- and fixed-firm-effect panel regressions, both of which are estimated by generalized least squares.[21] Panel C of Table 5 presents the regression results. In both tests, we find that the coefficient of auditor office size is negative and significant at the one percent level, suggesting that our findings are not likely to be driven by the omitted variable problem.

(Insert Table 5 about here)

Reverse Causality

Reverse causality arises if auditors seek out clients with certain characteristics. Auditors have their own preferences and may actively select clients with specific characteristics. For example, large auditor offices may prefer clients with lower operating and/or financial risk, resulting in the observed relations. To address this issue, we adopt a two-stage least-squares (2SLS) approach. In the first stage, we regress auditor office size against the instrumental variable and then use the predicted value of office size in the second-stage regression.

We use local office size, defined as the distance-weighted average auditor office size within a 500-mile radius of the firm as the instrumental variable[22] [23]. The weight is the reciprocal of the

[21] The fixed-effect estimator subtracts the time averages from the corresponding variables, while the random-effect estimator subtracts a fraction of that time average, where the fraction depends on the variance of the fixed-effect and error term, as well as the number of time periods.
[22] The construction procedure for local office size is described in Appendix B.
[23] Massa et al. (2010) use a similar method in constructing the turnover of local institutional bondholders.

geographic distance between the firm and the auditor office. We manually collect the geographic location of the auditor practice offices from the Audit Analytics database. Data on the geographic location of the headquarters of each of our sample firms are obtained from the Compustat. We calculate the geographic distance between the auditor and the client based on the latitude and longitude of their locations using Vincenty's (1975) equations. Firms are likely to choose local auditor practice offices for ease of communication and cooperation. This is evident in our sample as the median distance between the firm and the auditor office is only 287.69 miles. The average size of the local auditor practice office is closely related to the firm's auditor office size but does not have any direct impact on idiosyncratic volatility other than through the firm's auditor office size. Therefore, local office size is deemed to be an appropriate instrument in our setting (Larcker and Rasticus 2010).

The results for the 2SLS are presented in Table 6. Column (1) shows the results for the first-stage regression. In this regression, we include local office size and the control variables in the second-stage regression. We find that the coefficient of local office size is positive and highly significant, consistent with our expectation that local office size is closely related to the firm's auditor office size. Columns (2) and (3) present the results for second-stage regressions, which show significant negative relation between the predicted auditor office size and idiosyncratic return volatility and a significant positive relation between the predicted auditor office size and earnings announcement volatility ratio. These results show that our findings are robust to the reverse causality problem.

(Insert Table 6 about here)

V. CONCLUSIONS

In this paper, we examine how audit quality influences investors' pricing decisions. Our claim is that in pricing the equity of the firm investors rely on a combination of firm-specific information through the firm's financial statements and from other sources such as disclosures by the firm, analysts, other capital market participants, and private information collected by informed traders. Higher audit quality increases the information content of financial statements. Moreover, certification by a high quality auditor increases the confidence of investors in the financial statement numbers. As a result, the investors' price response becomes more concentrated at the time of release of financial statements. High audit quality and the resulting high earnings quality also render the private information collection by investors less useful. This effect, in conjunction with better anticipation of the prospective information at the time of financial statements will render the daily firm-specific news releases less informative. This leads to a reduction of average idiosyncratic return volatility. Another effect is the concentration of idiosyncratic return volatility at the times of financial statements relative to other times. Accordingly, we hypothesize a negative association between audit quality and idiosyncratic return volatility and a positive association between audit quality and the concentration of idiosyncratic return volatility during financial statement periods. We also hypothesize that the negative relation between audit quality and idiosyncratic return volatility and the positive relation between audit quality and the concentration of idiosyncratic return volatility during financial statement periods are stronger in firms with lower accruals quality.

We document several new results. First, we document a significant negative relation between audit quality and idiosyncratic return volatility. Second, we show that idiosyncratic return volatility gets concentrated at times of earnings announcements for high audit quality firms.

Third, we show that the effects of audit quality on idiosyncratic return volatility and the concentration of idiosyncratic return volatility during financial statement periods are incremental to accruals quality, and the effects are stronger for firms with lower accruals quality. There are two important implications of our findings. First, higher audit quality reduces average idiosyncratic return volatility and concentrates it at times of financial statements thereby affecting the information flow pattern to the investors. Second, given that firm-specific risks are not fully diversified away, our findings provide evidence that audit quality matters to capital market participants.

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APPENDIX A
Variable Definitions

This appendix presents the definitions of the variables used in the analysis. Characters in the parentheses refer to the item name in Compustat.

ABACC =	The square of the abnormal accruals computed using the performance adjusted modified Jones model specified in Kothari et al. (2005).
AGE =	Natural logarithm of the number of years the firm has existed in the CRSP database.
BIGN =	Dummy variable equal to one if the firm is audited by a Big N auditor and zero otherwise.
DD =	The accrual quality measure of Dechow and Dichev (2002) augmented by McNichols (2002).
DDIV =	Dummy variable equal to one if dividend per share (DVPSP_C) is positive and zero otherwise.
DVR =	Dummy variable equal to one if the firm has more than one business segment and zero otherwise.
EAV =	Idiosyncratic return volatility computed over the four quarterly earnings announcement periods (i.e., event days [-3,+1] around each earnings announcement) divided by the idiosyncratic return volatility computed over all the other days during the year.
LEV =	Long-term debt (DLTT) divided by book assets (AT).
MB =	Stock Price (PRCC_F) times Shares Outstanding (CSHPRI), then divided by Book equity (CEQ).
MRG =	Dummy variable equal to one if the firm is involved in mergers and acquisitions and zero otherwise.
OFC =	Natural logarithm of the annual aggregate audit fees (in millions of U.S. dollars) collected by the auditor's practice office that provide auditing services to the firm, taken from all the observations in the Audit Analytics database.
ROE =	Income before extraordinary items (IB) divided by book equity (CEQ).
SIZE =	Natural logarithm of book assets (AT).
SPEC =	Dummy variable equal to one if the firm is audited by an industry specialization auditor, auditor with the highest share in the industry by aggregate client assets or sales, and zero otherwise.
RET =	Cumulative stock returns over the fiscal year.
TNR =	Natural logarithm of the number of years the firm has retained its current auditor.
VAR =	Variance of the regression residuals from the Fama-French three-factor model. For ease of interpretation, we multiply the original VAR by 1000.
VROE =	Standard deviation of ROE over the previous three years.

APPENDIX B
Construction of Local Office Size

This appendix illustrates the construction of local office size, which is the instrumental variable for auditor office size. To construct the variable, we manually collect the geographic location of the auditor practice offices from the Audit Analytics database. The location of auditor practice offices are collected from the following websites in decreasing order of preference: (1) Respective auditor's official website; (2) U.S. Yellow Pages; (3) www.yelp.com; (4) State business listings; and (5) Google search. Roughly 50% of the data are obtained from the respective auditor's official website. The remaining data are obtained from the other four listed sources. We obtain the location of all practice offices of the Big N auditors and about 70% of the practice offices of non–Big N auditors. About 30% of non–Big N offices have closed their business rendering it impossible to access the data via web search. Geographic location of the headquarters of our sample firms is obtained from Compustat. We calculate the geographic distance between the auditor and the client firm based on the latitude and longitude of their locations. We use the Stata command *geodist* to do the calculation, which calculates the ellipsoidal distances between two points using the coordinates of the two points based on Vincenty's (1975) equations.

For each firm-year, we first locate the 500-mile radius region and then find all the auditor practice offices located within the region. Next, we calculate the distance-weighted average auditor office size (LCOFC) within the region as:

$$LCOFC = \sum_{j} w_{ij} * OFC_j$$

where i denotes firm, j denotes auditor offices and OFC is auditor office size. The weight w_{ij} is defined as:

$$w_{ij} = \frac{1}{d_{ij}} \Big/ \sum_{All} \frac{1}{d_{ij}}$$

where d is the distance between the auditor office and the firm.

TABLE 1
Summary Statistics

	Mean	S.D.	25%	Median	75%
VAR	1.568	2.406	0.307	0.699	1.711
EAV	2.076	2.273	0.669	1.347	2.593
OFC	2.544	1.904	1.283	2.758	4.041
BIGN	0.743	0.437	0.000	1.000	1.000
TNR	1.900	0.916	1.386	1.946	2.565
ROE	-0.035	1.063	-0.042	0.077	0.147
VROE	0.518	2.085	0.024	0.065	0.208
LEV	0.171	0.201	0.003	0.100	0.271
MB	2.581	5.209	1.065	1.742	2.961
SIZE	6.290	2.178	4.765	6.243	7.663
DDIV	0.412	0.492	0.000	0.000	1.000
AGE	2.384	0.916	1.792	2.398	2.996
DVR	0.366	0.482	0.000	0.000	1.000
MRG	0.165	0.371	0.000	0.000	0.000
RET	0.157	0.713	-0.242	0.064	0.372
No. of Obs.			51,559		

This table presents the mean, standard deviation (S.D.), 25-percentile (25%), median, and 75-percentile (75%) of each variable. Our initial sample consists of all firms in the Audit Analytics database spanning the 2000–2010 period. We obtain firm financial information from Compustat and stock returns from CRSP. We winsorize all the variables at the upper and lower one-percentile. Variable definitions are presented in Appendix A.

TABLE 2
Correlation Matrix

	VAR	***EAV***	***OFC***	***BIGN***	***TNR***	***ROE***	***VROE***	***LEV***	***MB***	***SIZE***	***DDIV***	***AGE***	***DVR***	***MRG***	***RET***
VAR		-0.204	-0.221	-0.204	-0.197	-0.403	0.541	-0.187	-0.198	-0.599	-0.548	-0.277	-0.061	-0.035	-0.246
EAV	-0.149		0.198	0.133	0.160	0.158	-0.122	-0.038	0.152	0.119	-0.017	0.115	0.039	0.071	0.062
OFC	-0.181	0.167		0.589	0.200	0.070	0.022	0.085	0.134	0.316	0.043	0.105	0.099	0.089	0.024
BIGN	-0.167	0.105	0.610		0.260	0.098	-0.010	0.122	0.130	0.352	0.068	0.054	0.112	0.087	0.059
TNR	-0.142	0.125	0.197	0.255		0.127	-0.106	0.098	0.081	0.217	0.154	0.432	0.125	0.024	0.080
ROE	-0.176	0.079	0.022	0.030	0.050		-0.308	0.091	0.244	0.309	0.302	0.158	0.039	0.017	0.249
VROE	0.237	-0.068	-0.004	-0.022	-0.056	-0.048		-0.004	0.023	-0.341	-0.419	-0.184	-0.028	-0.014	-0.157
LEV	-0.039	-0.058	0.106	0.117	0.056	0.040	0.118		-0.109	0.389	0.170	0.104	0.131	0.068	0.027
MB	-0.042	0.061	0.041	0.035	0.026	-0.183	0.148	-0.059		0.028	0.012	0.018	-0.010	0.058	0.299
SIZE	-0.426	0.065	0.337	0.352	0.207	0.118	-0.158	0.233	-0.059		0.498	0.213	0.121	0.097	0.099
DDIV	-0.341	-0.027	0.035	0.068	0.151	0.125	-0.136	0.069	-0.010	0.490		0.275	0.047	-0.054	0.104
AGE	-0.195	0.092	0.110	0.062	0.402	0.079	-0.091	0.044	-0.008	0.223	0.276		0.173	-0.039	0.071
DIVER	-0.049	0.034	0.106	0.112	0.118	0.018	-0.040	0.088	-0.027	0.117	0.047	0.174		0.111	0.004
MERG	-0.045	0.063	0.095	0.087	0.026	0.001	-0.016	0.040	0.002	0.097	-0.054	-0.041	0.111		-0.015
RET	-0.034	0.018	-0.003	0.028	0.028	0.076	-0.021	-0.008	0.116	-0.010	-0.009	0.026	-0.002	-0.021	

This table presents the Pearson and Spearman correlation matrix between the variables used in the regressions. The lower-left part presents the Pearson correlation matrix and the upper-right part presents the Spearman correlation matrix. Our initial sample consists of all firms in the Audit Analytics database spanning the 2000–2010 period. We obtain firm financial information from Compustat and stock returns from CRSP. We winsorize all the variables at the upper and lower one-percentile. Variable definitions are presented in Appendix A.

TABLE 3
Auditor Office Size and Idiosyncratic Return Volatility

Dependent Variable:	***VAR***	***EAV***
	(1)	**(2)**
OFC	-0.022	0.086
	(-2.509)**	(7.849)***
BIGN	-0.111	0.180
	(-2.766)***	(4.257)***
TNR	-0.103	0.050
	(-7.202)***	(2.722)***
ROE	-0.212	0.083
	(-11.15)***	(8.841)***
VROE	0.167	-0.032
	(14.94)***	(-5.000)***
LEV	0.458	-0.200
	(5.393)***	(-2.372)**
MB	0.002	-0.003
	(1.718)*	(-0.207)
SIZE	-0.336	0.130
	(-32.73)***	(11.36)***
DDIV	-0.609	-0.204
	(-22.13)***	(-4.713)***
AGE	-0.086	0.124
	(-5.532)***	(7.014)***
DVR	-0.011	-0.013
	(-0.363)	(-0.378)
MRG	-0.168	0.099
	(-7.198)***	(2.881)***
RET	0.019	-0.047
	(0.821)	(-2.664)***
Obs.	51,559	37,738
Adj. R^2	0.341	0.142

This table presents the regression results for the relation between idiosyncratic return volatility and audit quality. Our initial sample consists of all firms in the Audit Analytics database spanning the 2000–2010 period. We obtain firm financial information from Compustat and stock returns from CRSP. We winsorize all the variables at the upper and lower one-percentile. Constant, year fixed effects, and industry fixed effects based on two-digit SIC codes are included. The regression is performed by OLS, with *t*-statistics computed using standard errors corrected for both serial correlation and heteroskedasticity. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively. Variable definitions are presented in Appendix A.

TABLE 4
Controlling for Accruals Quality Measures

Dependent Variable:	***VAR***	***EAV***	***VAR***	***EAV***	***VAR***	***EAV***
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
OFC			-0.030	0.100	0.011	0.061
			(-2.576)**	(6.056)***	(0.634)	(4.378)***
DD	5.557	-2.192	5.553	-2.156	7.876	-2.104
	(11.449)***	(-4.613)***	(11.419)***	(-4.546)***	(10.239)***	(-2.558)**
*OFC*DD*					-1.133	0.220
					(-5.042)***	(3.071)***
BIGN	-0.156	0.334	-0.095	0.152	-0.057	0.153
	(-3.134)***	(5.882)***	(-1.814)*	(2.457)**	(-1.099)	(2.455)**
TNR	-0.012	0.096	-0.010	0.088	-0.015	0.087
	(-0.641)	(3.908)***	(-0.567)	(3.582)***	(-0.844)	(3.584)***
ROE	-0.175	0.100	-0.176	0.102	-0.179	0.102
	(-7.372)***	(7.326)***	(-7.391)***	(7.490)***	(-7.496)***	(7.474)***
VROE	0.127	-0.043	0.127	-0.045	0.127	-0.045
	(8.601)***	(-5.124)***	(8.633)***	(-5.425)***	(8.645)***	(-5.418)***
LEV	0.659	-0.200	0.657	-0.199	0.650	-0.199
	(6.034)***	(-1.622)	(6.024)***	(-1.616)	(5.967)***	(-1.618)
MB	-0.001	0.002	-0.001	0.002	-0.001	0.002
	(-5.609)***	(1.504)	(-5.587)***	(1.410)	(-5.535)***	(1.412)
SIZE	-0.359	0.155	-0.353	0.141	-0.358	0.141
	(-27.171)***	(9.264)***	(-26.957)***	(8.248)***	(-27.333)***	(8.213)***

(continued on next page)

Dependent Variable:	***VAR***	***EAV***	***VAR***	***EAV***	***VAR***	***EAV***
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
DDIV	-0.389	-0.143	-0.396	-0.121	-0.401	-0.121
	(-12.238)***	(-2.325)**	(-12.417)***	(-1.960)*	(-12.640)***	(-1.961)**
AGE	-0.085	0.018	-0.082	0.007	-0.088	0.007
	(-3.483)***	-0.527	(-3.363)***	-0.214	(-3.586)***	(0.210)
DIVER	0.017	-0.053	0.017	-0.056	0.015	-0.056
	(0.505)	(-1.109)	(0.522)	(-1.179)	(0.461)	(-1.178)
MERG	-0.119	0.100	-0.119	0.103	-0.120	0.103
	(-4.549)***	(2.110)**	(-4.561)***	(2.172)**	(-4.631)***	(2.171)**
RET	0.197	-0.085	0.196	-0.079	0.197	-0.079
	(7.546)***	(-3.255)***	(7.504)***	(-3.028)***	(7.570)***	(-3.028)***
Obs.	27,602	20,269	27,602	20,269	27,602	20,269
Adj. R^2	0.348	0.138	0.349	0.140	0.351	0.140

This table presents the regression results for the relation between idiosyncratic return volatility and audit quality controlling for accrual quality measures. Our initial sample consists of all firms in the Audit Analytics database spanning the 2000–2010 period. We obtain firm financial information from Compustat and stock returns from CRSP. We winsorize all the variables at the upper and lower one-percentile. Constant, year fixed effects, and industry fixed effects based on two-digit SIC codes are included. The regression is performed by OLS, with *t*-statistics computed using standard errors corrected for both serial correlation and heteroskedasticity. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively. Variable definitions are presented in Appendix A.

TABLE 5
Alternative Specifications

	Coefficient of Audit Quality	
Dependent Variable:	***VAR***	***EAV***
	(1)	**(2)**
Panel A. Alternative idiosyncratic return volatility models		
Value-weighted market model	-0.020	0.085
	(-2.218)**	(7.346)***
Equal-weighted market model	-0.022	0.088
	(-2.437)**	(7.956)***
Carhart four-factor model	-0.023	0.087
	(-2.560)**	(7.254)***
Panel B. Alternative audit quality measures		
Auditor office size by total fees	-0.023	0.081
	(-2.560)**	(7.318)***
Auditor office size by No. of clients	-0.037	0.123
	(-3.872)***	(9.017)***
Auditor industry specialization by client assets	-0.085	0.167
	(-3.441)***	(5.246)***
Auditor industry specialization by client sales	-0.072	0.188
	(-2.942)***	(5.864)***
Panel C. Alternative regression methods		
Random-effects panel	-0.127	0.262
	(-11.61)***	(13.49)***
Fixed-effects panel	-0.146	0.219
	(-9.595)***	(20.66)***

This table presents the results from regressing idiosyncratic return volatility (*VAR*) on auditor office size (*OFC*). The results are presented in three panels. Panel A presents the results from regressing idiosyncratic return volatility on auditor office size using three alternative models of idiosyncratic return volatility. Panel B presents the results from regressing idiosyncratic return volatility on auditor office size using alternative definitions of audit quality. Panel C presents the results of random- and fixed-effect panel regressions. Our initial sample consists of all firms in the Audit Analytics database spanning the 2000–2010 period. We obtain firm financial information from Compustat and stock returns from CRSP. We winsorize all the variables at the upper and lower one-percentile. Constant, year fixed effects, and industry fixed effects based on two-digit SIC codes are included. The regression is performed by OLS, with *t*-statistics computed using standard errors corrected for both serial correlation and heteroskedasticity. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively. Variable definitions are presented in Appendix A.

TABLE 6
Two-stage Least Squares (2SLS)

	First-stage Regression	Second-stage Regression	
Dependent Variable:	***OFC***	***VAR***	***EAV***
	(1)	**(2)**	**(3)**
Pred-OFC		-0.152	0.357
		(-6.083)***	(10.78)***
LCOFC	0.354		
	(33.96)***		
BIGN	2.229	0.162	-0.385
	(69.38)***	(2.454)**	(-5.052)***
TNR	0.022	-0.069	0.104
	(1.751)*	(-5.028)***	(5.499)***
ROE	-0.013	-0.216	0.092
	(-1.874)*	(-11.38)***	(9.030)***
VROE	0.025	0.170	-0.040
	(5.858)***	(15.28)***	(-5.737)***
LEV	-0.218	0.446	-0.185
	(-3.168)***	(5.247)***	(-2.040)**
MB	0.002	-0.001	-0.002
	(1.154)	(-1.730)*	(-0.341)
SIZE	0.233	-0.304	0.076
	(27.25)***	(-26.53)***	(5.651)***
DDIV	-0.118	-0.645	-0.145
	(-3.637)***	(-22.53)***	(-3.112)***
AGE	-0.012	-0.089	0.091
	(-0.773)	(-5.620)***	(4.675)***
DVR	-0.025	-0.019	-0.012
	(-0.905)	(-0.646)	(-0.313)
MRG	-0.001	-0.168	0.102
	(-0.0712)	(-7.183)***	(2.782)***
RET	-0.011	0.011	-0.035
	(-1.254)	(0.504)	(-1.788)*

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	First-stage Regression	Second-stage Regression	
Dependent Variable:	***OFC***	***VAR***	***EAV***
	(1)	**(2)**	**(3)**
Obs.	51,558	51,558	37,185
Adj. R^2	0.555	0.336	0.115

This table presents the results of the two-stage least-squares regression. Our initial sample consists of all firms in the Audit Analytics database spanning the 2000–2010 period. We obtain firm financial information from Compustat and stock returns from CRSP. We winsorize all the variables at the upper and lower one-percentile. Constant, year fixed effects, and industry fixed effects based on two-digit SIC codes are included. In the first stage, we regress auditor office size (*OFC*) against the instrumental variable local office size (*LCOFC*). In the second stage, we regress idiosyncratic return volatility (*VAR*) and earnings announcement volatility ratio (*EAV*) against the predicted value of auditor office size (*Pred-OFC*) obtained from the first-stage regression, respectively. *t*-statistics are computed using standard errors corrected for both serial correlation and heteroskedasticity. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively. Variable definitions are presented in Appendix A.

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Referee for:

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