University of New Haven

American Business Review

Volume 23 | Number 2 Article 1

11-2020

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Article

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American Business Review
Nov. 2020, Vol.23(2) 182 - 210

ISSN: 2689-8810 (Online)
ISSN: 0743-2348 (Print)

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https://doi.org/10.37625/abr.23.2.182-210

ABSTRACT

The foundation of economic theory is based on the premise that prices will converge to their equilibrium value. However, prior research has documented that stock prices cluster on round pricing increments. In this study, we develop and test the hypothesis that audit quality and the management of earnings—both of which affects the information environment of the firm—influence the degree of price clustering. Results show that firms with Big 4 auditors have less clustering in their stock prices while firms with higher abnormal audit fees, more discretionary accruals, and firms that tend to manipulate earnings have a higher degree of price clustering. These findings support our hypothesis and suggest that accounting information quality helps explain the price clustering anomaly and subsequently influences the efficiency of financial markets.

KEYWORDS

Price Clustering, Round Prices, Big 4, Earnings Manipulation

INTRODUCTION

Economic theory is based, in part, on the idea that prices will converge towards their equilibrium value. However, prices in various financial markets are not uniformly distributed across all pricing increments. Instead, stocks tend to cluster on round prices. First documented in the 1960s, research has shown that both commodity and stock prices are more likely to occur at whole dollars than at half dollars and more likely to occur at half dollars than at quarters (Wyckoff, 1963; Niederhoffer and Osborne 1966). Even in more modern financial markets, research continues to show that prices tend to cluster on round numbers (Ball, Torous, and Tschoegl, 1985; Harris, 1991; Ap Gwilym, Clare, and Thomas, 1998; Hameed and Terry, 1998; Bessembinder, 1999; Sopranzetti and Datar, 2002; Ahn, Cai, and Cheung, 2005; Ni, Pearson, and Poteshman, 2005; Ohta, 2006; Sonnemans, 2006; Alexander and Peterson, 2007; Ikenberry and Weston, 2008; Blau, Van Ness, and Van Ness, 2012; Blau and Griffith, 2016). The implications of such clustering are broad. Seminal research by Hayek (1945) and Friedman (1977) contend that in general, prices play an important role as an information mechanism. Said differently, equilibrium prices reveal information to other market participants. When stock prices are not uniformly distributed across all increments and instead cluster on round prices, the presence of clustering begins to question how informative stock prices really are. The presence of price clustering in financial markets might inhibit the efficiency of financial markets (Malkiel and Fama, 1970), which is

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a central tenet of asset pricing theory. Therefore, identifying factors that contribute to the presence of price clustering becomes important.

Two explanations for the presence of price clustering seem to have the most merit. First, as discussed in Wyckoff (1963) and Niederhoffer and Osborne (1966), the presence of price clustering is possibly explained by a simple behavioral preference for round numbers. Humans think in round numbers and therefore trade in round numbers. Individual preferences for round numbers are well documented even outside of the scope of financial markets. For instance, Pope and Simonsohn (2011) show that professional baseball players adjust their traditional behavior in order to finish the season batting above rather than below .300. Similarly, Pope and Simonsohn (2011) also find that high school students are more likely to retake the SAT exam after scoring just below a round number. In the context of price clustering, the behavioral preferences for round numbers suggest that investors and traders are more likely to submit limit orders on round prices than on non-round prices, which might result in a greater degree of price clustering. Harris (1991) presents a second explanation, arguing that the presence of price clustering is consistent with the idea that negotiating equilibrium prices is costly for investors. Therefore, market participants tend to settle on round prices in order to avoid additional negotiations costs, which might be associated with additional time needed for further negotiations or costs of information acquisition. Harris (1991) shows that price clustering is greater for smaller-cap stocks and stocks that are more volatile—a subset of stocks in which information acquisition costs are likely to be higher. It is important to note that the two explanations are not mutually exclusive. That is, the tendency to settle on round prices to avoid further negotiation costs might still be consistent with behavioral preferences for round prices.

Given the observed level of and explanations for price clustering, this study develops and tests the hypothesis that more reliable accounting information – or accounting information of higher quality – reduces the level of price clustering in financial markets. In particular, we posit that audit quality reduces the level of price clustering while earnings management and earnings manipulation increase price clustering. Our hypothesis is motivated by the intuitive idea that when accounting information is of higher quality at the firm level, the information acquisition costs (Harris, 1991) and the uncertainty about the true value of stocks (Bradley, Cooney, Jordan and Singh, 2004) are lower. To the extent that this is true, traders and investors will face lower negotiation costs and stock prices will cluster less on round-pricing increments. We conduct a series of multivariate tests and find that firms with Big 4 auditors have lower levels of stock price clustering. In economic terms, our tests show that relative to non-Big 4 firms, firms with Big 4 auditors have price clustering that is 1% lower. Additional robustness tests show that changes from Big 4 auditors are also associated with an increase in price clustering. We find that the absolute value of abnormal audit fees, positive abnormal audit fees, and negative abnormal audit fees are associated with more price clustering.[1] In additional tests, we find that discretionary accruals are directly related to the degree of price clustering. In economic terms, a one standard deviation increase in discretionary accruals is associated with a 76-basis point increase in price clustering. Likewise, a one standard deviation increases in the firm's Beneish (1999) M-Score, which measures the degree of earnings manipulation, is associated with a 35-basis point increase in price clustering. These findings tend to support our hypothesis and speak to the importance of high-quality accounting information on stock prices. Our results also indirectly support the findings in Chiao and Wang (2009) who show that trading by the most informed investors leads to a reduction in the level of price clustering, thus highlighting the important link between information acquisition and price clustering. Indeed, our findings contribute to the broad literature that examines how higher-quality accounting information can influence the overall efficiency of financial markets (Dopuch and Simunic,

[1] We also perform our analysis with levels and changes of raw audit fees. Our findings are consistent with the conclusions we subsequently draw.

1982; Dodd, Dopuch, Hothausen, and Leftwich, 1984; Loudder, Khurana, Sawyers, Cordery, Johnson, Lowe, and Wunderle, 1992; Dechow, Sloan, and Sweeney, 1995; Subramanyam, 1996; Weber and Willenborg, 2003; Francis, 2004; Richardson, Sloan, Soliman, and Tuna, 2005; Gul, Kim, and Qiu, 2010; Iliev, 2010; among others). In addition, our findings fit nicely into the literature that discusses potential explanations for why price clustering occurs (Ball et al. 1985; Harris, 1991).

The rest of this paper is organized as follows. Section 2 provides background and a discussion of relevant literature. Section 3 describes the data used throughout the analysis. Section 4 presents the empirical results, and Section 5 offers some concluding remarks.

RELATED LITERATURE

In this section, we provide a more detailed discussion of the related literature. As mentioned previously, this study tests the hypothesis that higher-quality accounting information will lead to less price clustering in financial markets. Throughout the study, we use two categories of accounting information: auditor quality and earnings management/manipulation.

AUDIT QUALITY

To determine the quality of auditors, we follow a broad literature and classify firms into those with Big 4 auditors and those with non-Big 4 auditors. Dopuch and Simunic (1980) find that larger audit firms provide higher-quality services to maintain their reputational capital. Likewise, DeAngelo (1981) and Francis and Wilson (1988) discuss how auditor size could proxy for auditor quality. Empirically, Palmrose (1988) and Becker, DeFond, Jimbalvo, and Subramanyam (1998) show that firms with the largest external auditors have lower litigation rates and fewer instances of earnings management. Behn, Choi, and Kang (2008) and Lawrence, Minutti-Meza, and Zhang (2011) also provide evidence that the Big 4 (or Big 5) audit firms provide higher-quality audit services than non-Big 4 (or Big 5) audit firms. Therefore, in our subsequent tests, we examine the association between price clustering in financial markets and whether a particular firm uses a Big 4 audit firm. Additionally, we examine how price clustering varies in years when firms change from a Big 4 auditor to a non-Big 4 auditor and visa-versa.

In addition to using the Big 4 audit firm classification, we also examine the association between price clustering and abnormal audit fees. Abnormal audit fee is computed by estimating the residuals from the audit fee determination model. A growing debate in the literature attempts to determine how abnormal audit fees reflect audit quality. On one hand, higher audit fees can represent greater audit efforts, and thus, a higher-quality audit (the effort view). In support of this view, Eshleman and Guo (2014) show that abnormal audit fees is positively related to audit quality. Similarly, Blankley, Hurtt, and MacGregor (2012) find that high abnormal audit fees is associated with less likelihood of earnings restatements. Higgs and Skantz (2006) use earnings response coefficients to measure perceived audit quality and find similar results. On the other hand, higher audit fees can also be viewed as bribes or economic rents being earned by the auditor (Kinney and Libby 2002). Academic literature refers to this view as the "economic bonding view". In support of this view, Choi, Kim, and Zhang (2010) find that abnormal (positive) audit fees are negatively associated with audit quality. Similarly, Asthana and Boone (2012) find that audit quality declines as negative abnormal fee increases. We follow Doogar, Sivadasan, and Solomon (2015) to construct the audit fee determination model.[2] The residual of the model captures the fee variation within auditor-type. We use absolute values of the fee residual to measure the extent of fee variation. In addition, we separate the positive and negative fee residuals, as such positive and negative fee residuals contain different elements of auditor rents (Defond, Raghunandan, Subramanyam 2002; Hope and Langli 2010; Larcker and Richardson 2004; Choi et al. 2010; Asthana and Boone 2012). According to Asthana and Boone (2012), positive fee residuals indicate an above expected fee, resulting in potential compromised auditor independence while negative fee residuals capture the client's strong bargaining power over an auditor, resulting in a negative impact on the auditor's independence and auditing quality. We are careful to note, however, the results in Choi et al. (2010) who do not find a meaningful relationship between negative abnormal audit fees and audit quality. Despite the lack of consensus, when focusing on the absolute fee residuals, both positive and negative, the absolute value of abnormal audit fees might be directly associated with greater price clustering. Indirectly, our tests using the absolute value of abnormal audit fees might contribute to the debate about how abnormal audit fees reflect auditor quality. As with our Big 4 audit firm tests, we also examine changes in abnormal audit fees for additional robustness.

EARNINGS MANAGEMENT AND MANIPULATION

For the second category of accounting information quality, we examine the relation between price clustering and the propensity of firms to manage and possibly manipulate their earnings. Subramanyam (1996) finds that discretionary accruals affect stocks prices and argues that accruals reflect the management of earnings. Dechow et al. (1995), Becker et al. (1998), Rangan (1998), and Cohen and Zarowin (2010) among others, make similar arguments. To the extent that discretionary accruals represent earnings management, and that earnings management lowers the quality of accounting information, our hypothesis predicts that firm-level discretionary accruals will directly affect the degree of price clustering.

Our final measure of accounting information quality is the Beneish M-Score. Like the Altman Z-Score that measures bankruptcy risk, the M-Score is used to proxy for earnings manipulation and is obtained using a combination of eight different indices.[3] A large number of studies have used the M-Score as a

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[2] *Ln(AUDIT FEEit)* = b0+b1*LNASSETit* + b2*LOSSit* + b3*ROAit* + b4*LEVERAGEit* + b5*INVRECit* + b6*FOROPSit*+b7*EMPLOYEES_SQROOTit*+b8*NSEGMENTSit*+b9*NEWFINit*+b10*EXTDISTit* +b11*GCOit*+ b12*ICWEAKit* +b13*BUSYit* + b14*DELAYit* + b15*AFILERit* + b16*BIG4it* +*YEAR FIXED EFFECTS* +*INDUSTRY FIXED EFFECTS* + *εit*

Where: *LNASSET* is the natural logarithm of total assets; *LOSS* take the value if the company reports negative net income, and 0 otherwise; ROA is auditee return on asset; *LEVERAGE* is the ratio of total liabilities to total assets; *INVREC* is the sum of auditee inventory and receivables scaled by auditee total assets; *FOROPS* takes the value 1 if the auditee reports a foreign currency translation adjustment, 0 otherwise; *EMPLOYEE_SQROOT* is the square root of the number of auditee employees (measured in thousands); *NSEGMENTS* is the number of business segments; *NEWFIN* takes the value 1 if the sum of new equity and debt issue exceeds $50,000 and 0 otherwise; *EXTDIST* takes the value 1 if the absolute value of extraordinary items or discontinued operation exceeds $10,000 and 0 otherwise. *GCO* takes the value 1 if the auditor opinion for the fiscal year includes a going concern opinion and 0 otherwise; *ICWEAK* takes the value 1 if the auditor reports an internal control weakness and 0 otherwise. *BUSY* takes the value 1 if the auditee fiscal year ends in December and 0 otherwise; *DELAY* is the number of calendar days elapsed between the auditee's fiscal year-end and the date of the audit opinion; *AFILER* takes the value 1 if the auditee market value of equity at the end of the fiscal year exceeds $75 million and 0 otherwise; and *BIG4* takes the value 1 if the auditee hires one of the BIG 4 auditors and 0 otherwise.

[3] The indices include the Days' Sales in Receivables Index, the Gross Margin Index, the Asset Quality Index, the Sales Growth Index, the Depreciation Index, the Sales, General, and Administrative Expenses Index, the Leverage Index, and the Total Accruals to Total Assets index. The M-Score is the weighted (linear) combination of these variables obtained from point estimates from a regression analysis described in Beneish (1999).

measure of possible earnings manipulation (Teoh, Wong, and Rao, 1998; Jones, Krishnan, and Melendrez, 2008; Price, Sharp, and Wood, 2011; Beneish, Lee, and Nichols, 2013; DeFond, Lim, and Zang, 2015). In the framework of our hypothesis, the potential manipulation of earnings will harm accounting quality and lead to an increase in price clustering.

HOW HIGH-QUALITY ACCOUNTING INFORMATION INFLUENCE PRICE CLUSTERING

Given the discussion of our various proxies for accounting information quality, this subsection describes in more detail, how the lack of high-quality, reliable accounting information can influence the degree of price clustering. As previously mentioned, our hypothesis is intuitive and is based on the idea that stocks tend to cluster on round prices because of individual preferences for round numbers. These preferences result from traders' and investors' awareness that negotiating finer prices is costly (either in terms of additional time and/or information acquisition costs) and in order to avoid such costs, market participants tend to settle on round pricing increments (Harris, 1991). As mentioned above, results in Pope and Simonsohn (2011) suggest that preferences for round numbers will extend far beyond traders, investors, and other financial market participants. In addition, stock price clustering can also be associated with valuation uncertainty. For example, Bradley et al. (2004) find that IPOs with integer offer prices have higher first-day returns than those priced on dollar fractions. They argue that clustering at integers is a function of valuation uncertainty by the underwriter. When there is greater uncertainty about a firm's value, a greater probability that the offer price will be set at an integer to compensate the underwriter for assuming the additional risk. We argue that negotiation costs, which are a function of time and costs associated with the acquisition of information, are also a function of the risks associated with valuation uncertainty. When traditional accounting information is of lower quality, information acquisition becomes more costly and valuation risk becomes high. This idea is laid out nicely in a research stream that has shown low-quality accounting information generates uncertainty and opacity among market participants. Francis, LaFond, Olsson, and Schipper (2005) report that, due to uncertainty and opacity, poor accounting quality results in higher costs for firms. Similar results are found in Levitt (1998) and Foster (2003). The uncertainty generated by poor accounting information is likely to increase the information acquisition costs and valuation risks faced by investors – thus leading to a greater tendency for stock prices to cluster on round increments. As additional motivation for our tests, Chiao and Wang (2009) find that the trading of institutional investors – those who have been shown to be informed traders – reduce the level of price clustering. In the framework of our study, if the information environment of the firm is improved, then informed trading is likely to adversely affect the degree of price clustering. Determining whether poor accounting information explains the anomalous degree of price clustering becomes an empirical question, which we next seek to address.

DATA DESCRIPTION

To test our research question, we collect stock market data from the Center for Research on Security Prices (CRSP) and obtain financial statement data from COMPUSTAT. After receiving the daily prices, returns, trading volume, and other information from the CRSP, we compute a number of different variables to be used throughout the study. *CLUSTER%* represents the total number of cluster days divided by the total number of traded days of the stock in that year, in which cluster days is the total number of days the daily closing stock prices clustered on a $0.05 increment (Harris, 1991). *PRICE* represents the closing price of each stock at the end of each day. We follow Blau and Griffith (2016), among others and exclude stock prices less than $2 in our study. *SIZE* represents the market capitalization. *B/M* is the book to market ratio is calculated by using the book value of total equity divided by the market capitalization of the firm scaled up by 1,000. *MOMENTUM* represents the cumulative return for each stock for the period t-2 through t-12, where t is the current year. *SPREAD* is the difference between the daily ask and bid price scaled by the spread midpoint and averaged across the year. *TURNOVER* is the daily stock trading volume scaled by the number of shares outstanding averaged over the year. *VOLATILITY* represents the standard deviation of daily returns for each stock across the year. *ILLIQUIDITY* represents the average of each stock's daily illiquidity calculated using Amihud's (2002) methodology.[4]

The data on auditing characteristics is obtained from the Audit Analytics database. *BIG4* is an indicator variable that equals one if a firm is audited by one of the Big 4 audit firms during the year.[5] *AUDITFEES* are the necessary fees to perform the audit or review in accordance with the General Accepted Auditing Standards. Data from *COMPUSTAT* is used to calculate the absolute value of discretionary accruals by using the modified Jones' model, *D_ACCRUALS_DSS*, and Kothari, Leone, and Wasley (2005)'s performance-matched discretionary accrual measure, *D_ACCRUALS_KLW*.[6,7] We used the absolute value of discretionary accruals because of concerns with the magnitude of earning management, regardless of the direction (positive or negative earning management).[8] We also calculate the *MSCORE* following Beneish (1999) and Beneish et al. (2013) to measure the degree of earnings manipulation carried out by the firms.

Table 1 presents statistics that summarize the data. Our sample period ranges from 2001 through 2016. At the beginning of 2001, U.S. exchanges reduced the minimum tick-size from 1/16th of a dollar to decimals ($.01). Given that this regime change directly affects our definition of round prices (increments of $.05), we start our sample period in 2001. Panel A shows the accounting-related summary statistics. We find that on average about 68% of firms use a BIG4 auditor. Furthermore, the sample mean of *ABSOLUTE ABNORMAL FEES* is 0.399, *POSITIVE ABNORMAL FEES* is 0.396, and *NEGATIVE ABNORMAL FEES* is -0.413. In terms of earnings management and manipulation measures, the average of *D_ACCRUALS_DSS* is 0.108, *D_ACCRUALS_KLW* is 0.152, and *MSCORE* is -2.37.[9] Panel B presents the summary statistics of stock-related characteristics. We aggregate this information to the annual level for the 2001–2016 period. We find that firm prices close on round increments of $.05 about 76.5 days

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[4] The Amihud illiquidity ratio is the ratio of the absolute value of the daily stock return to its dollar volume and scaled up by 1,000,000.

[5] The big four audit firms are Deloitte, PricewaterhouseCoopers, Ernst & Young and KPMG

[6] Modified Jones model: The discretionary accrual is the difference between total accrual and the non-discretionary portion of the accruals. Total accruals are calculated as the change in total current assets, less the change in total current liabilities, less the change in cash, less the change in debt in the current liabilities, less the depreciation and amortization, and then scaled by the total assets of previous period. The non-discretionary accruals portion is the sum of three components—i.e., the inverse of last period total assets, change of revenue minus the change of receivable scaled by last period total assets and gross property plant and equipment scaled by last period total assets. The method to extract the discretionary portion of accruals makes use of an OLS regression using no intercept in which the total accruals are regressed against the three components of non-discretionary accruals. The residuals in this regression are the discretionary portion of accruals.

[7] Kothari, Leone, and Wasley (2005) performance-adjusted abnormal accruals are measured as the residuals from the following specification: $\frac{ACCR_{i,t}}{TA_{i,t-1}} = \theta + \theta_1 \frac{1}{TA_{i,t-1}} + \theta_2 \left(\frac{\Delta REV}{TA_{i,t-1}} - \frac{\Delta AR}{TA_{i,t-1}}\right) + \theta_3 \frac{PPE}{TA_{i,t}} + \theta_4 ROA_{i,t} + \varepsilon_{i,t}$; where $ACCR$ represents total accrual, which equals to the difference between net income and operation cash flows; TA is total assets from balance sheets; ΔREV is the change in revenues from the prior year to the current year; ΔAR is the change in accounts receivable from the prior year to the current year; PPE is net property, plant, and equipment on the balance sheet; ROA is return on assets, measured as net income divided by lagged assets.

[8] The absolute value of discretionary accruals is commonly used in the literature. See, for example, Bartov, Gul and Tsui (2000).

[9] To ensure that outliers not affect the conclusions we draw, we winsorize all variables at 1 and 99 percent.

per year or 30.1% of days.[10] This result supports the broad literature suggesting that prices disproportionately tend to cluster on round increments of $0.05. In a market without clustering, prices should be uniformly distributed across all pricing increments and therefore, *CLUSTER%* should be equal to 20%. However, we find that *CLUSTER%* is over 30% for the average stock in our sample. We also find that the average firm has a share price (PRICE) of $26.382, market capitalization (*SIZE*) of $13.357, *B/M* of 0.635, *MOMENTUM* of 0.119, a *SPREAD* of 0.7%, *TURNOVER* of 0.9%, *VOLATILITY* of 0.031, and *ILLIQUIDITY* of 1.094.

[10] If prices are indeed uniformly distributed across pricing increments randomly, prices should then close on round increments 20% of days, given that 20% of the pricing increments are considered "round". Finding that prices close on round increments on 30.1% of days rejects the notion prices are uniformly distributed. Unreported tests show that the difference between 30.1% and 20% is reliably significant at the .01 level.

Table 1. Summary Statistics

This table provides statistics that describe the sample used throughout the analysis. Panel A shows the summary statistics for various Accounting characteristics of the sample firms. Panel B presents the stock level summary statistics. *BIG4* is an indicator variable that takes on value of one for a firm that has obtained auditing services during that year from one of the four largest professional service networks in the world, namely Deloitte, PricewaterhouseCoopers, Ernst & Young and KPMG zero otherwise *ABSOLUTE ABNORMAL FEES* are the absolute value of the residual of normal audit fee determination model. *POSITIVE ABNORMAL FEES* are the positive residual of normal audit fee determination model. *NEGATIVE ABNORMAL FEES* are the negative residual of the normal audit fee determination model. *D_ACCRUALS_DSS* is the abnormal discretionary accruals measure calculated following Dechow et al. (1995). *D_ACCRUALS_KLW* is the abnormal discretionary accruals measure calculated following Kothari et al. (2005). *M-SCORE* is a measure of earning manipulation. It is calculated by using various accounting measures following the method of Beneish (1999). *CLUSTER%* is the total number Cluster Days, divided by the total number of days traded in that year, where cluster Days is the total number of days the daily closing stock prices clustered on $0.05. *PRICE* is the closing price for each stock at the end of each year. *LNSIZE* is the natural log of the market capitalization for each stock on the last trading day of the year. B/M is book value divided market capitalization for each firm scaled up by 1,000. *MOMENTUM* represents the cumulative returns of each stock from period of t-12 to t-2. *SPREAD* the relative (percent) bid-ask spread that is calculated as the difference between the ask price and the bid price scaled by the spread midpoint for each stock each day averaged over the year. *TURN* is the ratio of total trading volume scaled by the shares outstanding for each stock each day averaged over the year. *VOLATILITY* represents the standard deviation of return for each stock over the year. *ILLIQUIDITY* represents the yearly average of each stock daily illiquidity calculated using Amihud (2002) method, which is ratio of absolute stock return to its dollar volume and scaled up by 1,000,000.

VARIABLE	MEAN	STD.	25th PERCENTILE	MEDIAN	75th PERCENTILE
Panel A. Accounting Characteristics					
BIG4	*0.678*	*0.467*	*0.000*	*1.000*	*1.000*
ABSOLUTE ABNORMAL FEES	*0.399*	*0.331*	*0.149*	*0.321*	*0.562*
POSITIVE ABNORMAL FEES	*0.396*	*0.305*	*0.159*	*0.331*	*0.563*
NEGATIVE ABNORMAL FEES	*-0.413*	*0.400*	*-0.560*	*-0.308*	*-0.138*
D_ACCRUALS_DSS	*0.171*	*0.448*	*0.032*	*0.074*	*0.158*
D_ACCRUALS_KLW	*0.152*	*0.387*	*0.027*	*0.066*	*0.145*
MSCORE	*-2.360*	*1.706*	*-2.838*	*-2.378*	*-1.893*
Panel B. Stock Characteristics					
CLUSTER%	*0.301*	*0.109*	*0.226*	*0.266*	*0.347*
PRICE	*26.382*	*42.740*	*7.560*	*17.155*	*33.950*
SIZE	*13.357*	*1.936*	*12.024*	*13.253*	*14.594*
B/M	*0.635*	*3.146*	*0.245*	*0.468*	*0.813*
MOMENTUM	*0.119*	*0.762*	*-0.246*	*0.030*	*0.315*
SPREAD	*0.007*	*0.013*	*0.001*	*0.002*	*0.008*
TURN	*0.009*	*0.010*	*0.003*	*0.007*	*0.012*
VOLATILITY	*0.031*	*0.015*	*0.020*	*0.028*	*0.038*
ILLIQUIDITY	*1.094*	*9.786*	*0.001*	*0.006*	*0.062*

The correlation matrix in Table 2 points to the fact that *CLUSTER%* and *BIG4* auditors are negatively related, while the correlations between *CLUSTER%* and both *DISCRETIONARY ACCRUALS* and *MSCORE* are positive. These correlations are consistent with our proposed hypothesis. The *ABSOLUTE ABNORMAL FEES* and *POSITIVE ABNORMAL AUDIT FEES* are positively related to the *CLUSTER%*, while *NEGATIVE ABNORMAL FEES* are negatively associated with the *CLUSTER%*. These correlations are also consistent with our expectations.

Table 2. Correlation Matrix

This table reports Pearson Correlation coefficients for the variables used throughout the analysis.

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
[1] *CLUSTER%*	1.000							
[2] *BIG4*	-0.126	1.000						
[3] *ABSOLUTE ABNORMAL FEES*	0.056	-0.131	1.000					
[4] *POSITIVE ABNORMAL FEES*	0.015	-0.133	0.999	1.000				
[5] *NEGATIVE ABNORMAL FEES*	-0.089	0.138	-0.989	0.000	1.000			
[6] *D_ACCRUALS_DSS*	0.036	-0.191	0.069	0.091	-0.050	1.000		
[7] *D_ACCRUALS_KLW*	0.007	-0.188	0.060	0.081	-0.039	0.886	1.000	
[8] *MSCORE*	0.022	0.000	-0.005	-0.017	-0.008	-0.025	-0.013	1.000
[9] *PRICE*	-0.036	0.146	-0.036	-0.085	0.017	-0.055	-0.059	0.011
[10] *SIZE*	-0.378	0.423	-0.073	-0.051	0.097	-0.112	-0.098	0.008
[11] *B/M*	0.057	-0.004	-0.001	-0.011	-0.018	-0.038	-0.043	0.023
[12] *MOMENTUM*	0.031	0.000	-0.016	-0.031	0.001	0.013	0.015	0.104
[13] *SPREAD*	0.460	-0.291	0.050	-0.001	-0.089	0.053	0.037	-0.024
[14] *TURN*	-0.240	0.110	-0.012	0.005	0.022	0.070	0.068	0.048
[15] *VOLATILITY*	0.140	-0.155	0.039	0.045	-0.038	0.202	0.182	0.005
[16] *ILLIQUIDITY*	0.050	-0.123	0.022	-0.003	-0.039	0.008	-0.004	-0.010
	[9]	**[10]**	**[11]**	**[12]**	**[13]**	**[14]**	**[15]**	**[16]**
[9] *PRICE*	1.000							
[10] *SIZE*	0.421	1.000						
[11] *B/M*	-0.045	-0.136	1.000					
[12] *MOMENTUM*	0.085	0.063	-0.032	1.000				
[13] *SPREAD*	-0.172	-0.555	0.222	-0.009	1.000			
[14] *TURN*	0.037	0.198	-0.078	0.058	-0.253	1.000		
[15] *VOLATILITY*	-0.277	-0.439	0.035	-0.018	0.374	0.278	1.000	
[16] *ILLIQUIDITY*	-0.051	-0.0189	0.162	-0.015	0.526	-0.080	0.183	1.000

EMPIRICAL RESULTS

PRICE CLUSTERING AND BIG4 AUDITORS

In this section, we test our hypothesis that high audit quality is associated with lower levels of stock price clustering. Here, we use the definition of reputable auditors identified in the literature as the proxy for high auditing quality (i.e., the BIG4 audit firms). We begin by testing whether BIG4 auditors have an impact on the level price clustering. We estimate the following equation using the firm-year observations:

$$CLUSTER\%_{i,t} = \beta_0 + \beta_1 BIG4_{i,t} + \beta_2 LN(PRICE_{i,t}) + \beta_3 LN(SIZE_{i,t}) + \beta_4 {}^{B}/_{M_{i,t}} + \beta_5 MOMENTUM_{i,t} + \beta_6 SPREAD_{i,t} + \beta_7 TURNOVER_{i,t} + \beta_8 VOLATILITY_{i,t} + \beta_9 ILLIQUIDITY_{i,t} + \varepsilon_{i,t} \quad (1)$$

We note that all of our regression specifications include year fixed effects and robust standard errors that are clustered at the firm level. Table 3 shows that price clustering *CLUSTER%* is inversely related to firms that have BIG4 auditors after controlling for the relevant variables. We observe a significant negative relation between *CLUSTER%* and *BIG4* both in the baseline model as well as in the full specification. Additionally, *CLUSTER%* is negatively associated with market capitalization, book to market ratio, *TURNOVER, VOLATILITY,* and *ILLIQUIDITY*. We also find that price clustering is positively associated with prices, *MOMENTUM*, and the bid-ask spread.[11] The control variables included in equation (1) can be categorized as the size and value of stocks (*SIZE, PRICE,* and *B/M*), the liquidity and stability of stocks (*TURNOVER, SPREAD, ILLIQUIDITY, and VOLATILITY*), and the past performance of stocks (*MOMENTUM*). Combinations of these variables have been used in a number of other studies that examine price clustering (Harris, 1991; Ikenberry and Weston, 2009; Chiao and Wang, 2009; Bradley et al., 2004; Hameed and Terry, 1998; Ni et al., 2005; Baig and Sabah, 2019; Blau, 2019; among others). Columns [1] and [2] show the OLS regression results. In Column [2], the coefficient of independent variable, *BIG4*, is -0.009 (significant at the .01 level). Not only is the negative relation of the estimate statistically significant, the estimate is also economically meaningful. It shows that stock prices of firms with *BIG4* auditors have, on average, lower (about 1%) price clustering. Consistent with our hypothesis, these results indicate that firms with highly reputable auditors in turn have better accounting information quality, which results in less price clustering. Columns [3] and [4] represent the two-tailed Tobit regression results, which accounts for censoring of the dependent variable. Our OLS results are robust to the Tobit specification, as the results remain relatively unchanged. In sum, the findings from this table support our hypothesis that higher accounting information quality is negatively associated with price clustering in financial markets.

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[11] While Harris (1991) and Chiao and Wang (2009) find a positive association between volatility and price clustering, Baig and Sabah (2019) and Blau (2019) use more recent data and find a negative, contemporaneous relationship between volatility and price clustering.

Table 3. Price Clustering and Big 4 Auditors
This table reports the results from estimating the following equation. We use both OLS and TOBIT (censored) regression specifications.

$$CLUSTER\%_{i,t} = \beta_0 + \beta_1 BIG4_{i,t} + \beta_2 LN(PRICE_{i,t}) + \beta_3 LN(SIZE_{i,t}) + \beta_4 {}^{B}/_{M_{i,t}} + \beta_5 MOMENTUM_{i,t} + \beta_6 SPREAD_{i,t} + \beta_7 TURNOVER_{i,t} + \beta_8 VOLATILITY_{i,t} + \beta_9 ILLIQUIDITY_{i,t} + \varepsilon_{i,t}$$

The dependent variable CLUSTER% is the total number of daily stock closing prices that clustered on $0.05 divided by the total number of days traded in that year. As independent variable, *BIG4* is an indicator variable that takes on value of one for a firm that has obtain auditing services during that year from one of the four largest accounting firms, zero otherwise. For the definitions of control variables please refer to table 1. Corresponding robust t-statistics are reported in parentheses below each coefficient estimate. *, **, *** denote statistical significance at the 0.10, 0.05, and the 0.01 levels, respectively.

	CLUSTER%$_{i,t}$			
	OLS REGRESSIONS		**CENSORED REGRESSIONS**	
	[1]	**[2]**	**[3]**	**[4]**
INTERCEPT	*0.336**** *(138.32)*	*0.531**** *(41.09)*	*0.496**** *(151.85)*	*0.679**** *(46.10)*
BIG4	*-0.045**** *(-18.04)*	*-0.009**** *(-4.44)*	*-0.045**** *(-18.04)*	*-0.009**** *(-4.44)*
LNPRICE		*0.025**** *(11.20)*		*0.025**** *(11.21)*
LNSIZE		*-0.020**** *(-19.90)*		*-0.020**** *(-19.91)*
B/M		*-0.001** *(-1.93)*		*-0.001** *(-1.93)*
MOMENTUM		*0.008**** *(8.17)*		*0.008**** *(8.17)*
SPREAD		*1.966**** *(10.16)*		*1.966**** *(10.16)*
TURNOVER		*-0.574**** *(-5.73)*		*-0.574**** *(-5.73)*
VOLATILITY		*-1.042**** *(-12.12)*		*-1.042**** *(-12.13)*
ILLIQUIDITY		*-0.001**** *(-5.73)*		*-0.001**** *(-5.73)*
Num of Obs	*30152*	*28071*	*30152*	*28071*
Adj. R^2/Pseudo R^2	*0.501*	*0.631*	*-0.436*	*-0.627*
Year Fixed Ef	*YES*	*YES*	*YES*	*YES*
Robust SEs	*YES*	*YES*	*YES*	*YES*

PRICE CLUSTERING AND CHANGES IN AUDITOR QUALITY

We extend our analysis by testing the relation between price clustering and firm-level auditor change events. We split auditor change events into two categories. The first category is the "change from BIG4 to Non-BIG4" ($\Delta\, FROM\ BIG4$) – zero otherwise. By examining auditor change events, we can provide additional evidence for the results observed in the last table and potentially identify the direction of the price-clustering reaction to potential auditing quality change. To do so, we begin by estimating the following OLS equations using our firm-year observations:

$$CLUSTER\%_{i,t} = \beta_0 + \beta_1 \Delta FROM\ BIG4_{i,t} + \beta_2 LN(PRICE_{i,t}) + \beta_3 LN(SIZE_{i,t}) + \beta_4 {}^{B}/_{M_{i,t}} + \beta_5 MOMENTUM_{i,t} + \beta_6 SPREAD_{i,t} + \beta_7 TURNOVER_{i,t} + \beta_8 VOLATILITY_{i,t} + \beta_9 ILLIQUIDITY_{i,t} + \varepsilon_{i,t} \quad (2)$$

$$CLUSTER\%_{i,t} = \beta_0 + \beta_1 \Delta TO\ BIG4_{i,t} + \beta_2 LN(PRICE_{i,t}) + \beta_3 LN(SIZE_{i,t}) + \beta_4 {}^{B}/_{M_{i,t}} + \beta_5 MOMENTUM_{i,t} + \beta_6 SPREAD_{i,t} + \beta_7 TURNOVER_{i,t} + \beta_8 VOLATILITY_{i,t} + \beta_9 ILLIQUIDITY_{i,t} + \varepsilon_{i,t} \quad (3)$$

The dependent and independent variables in these models are the same as those in the previous regression specification with one exception. Instead of the BIG4 indicator as the independent variable of interest, we use an indicator variable $\Delta FROM\ BIG4$ (the indicator variable takes a value of one for a firm that switches from a BIG4 auditor to a non-BIG4 auditor during that year and zero for firms that continue to remain with a BIG4 auditor). Similarly, we use an indicator variable $\Delta TO\ BIG4$ (the indicator variable takes a value of one for a firm that switches from a non-BIG4 auditor to BIG4 auditor during that year and zero for those firms that remain with non-BIG4 auditors). $\Delta FROM\ BIG4$ essentially represents a decrease in audit quality, which would essentially signal a potential decrease in accounting information quality. Conversely, $\Delta TO\ BIG4$ represents an increased auditing quality, which essentially signals the improved accounting information quality.

Table 4 explores the relation between a decrease in firm-level auditing quality ($\Delta FROM\ BIG4$) and stock-level price clustering. Columns [1] and [2] in Table 4 represent the results for the two OLS specifications in which we use $\Delta FROM\ BIG4$ as the independent variable of interest. In Column [2], the coefficient on $\Delta From\ BIG4$ is 0.010 (*t-statistic* = 2.39). The estimate is both statistically significant and economically meaningful. Essentially, firms that (during a year) change from a Big 4 to a lower-tier audit firm experience an increase in relative price clustering of about 1%. Consistent with our hypothesis, this result indicates that a decrease in firm-level audit quality reduces the quality of accounting information, which in turn triggers an increase in price clustering. The results are robust to the Tobit model, as we observe similar results in Columns [3] and [4].

Table 4. Price Clustering and Changes in Auditor Quality
This table reports the results from estimating the following equation. We use both OLS and TOBIT (censored) regression specifications.

$$CLUSTER\%_{i,t} = \beta_0 + \beta_1 \Delta FROM\ BIG4_{i,t} + \beta_2 LN(PRICE_{i,t}) + \beta_3 LN(SIZE_{i,t}) + \beta_4 {}^{B}/_{M_{i,t}} + \beta_5 MOMENTUM_{i,t} + \beta_6 SPREAD_{i,t} + \beta_7 TURNOVER_{i,t} + \beta_8 VOLATILITY_{i,t} + \beta_9 ILLIQUIDITY_{i,t} + \varepsilon_{i,t}$$

The dependent variable *CLUSTER%* is the total number of daily stock closing prices that clustered on $0.05 divided by the total number of days traded in that year. As independent variable, $\Delta FROM\ BIG4$ is an indicator variable that takes on value of one for a firm that changes from a Big4 auditor to a non-Big4 audit firm in that year, zero for benchmark firms that continue to remain with a BIG4 auditor. For the definitions of control variables please refer to table 1. Corresponding robust t-statistics are reported in parentheses below each coefficient estimate. *, **, *** denote statistical significance at the 0.10, 0.05, and the 0.01 levels, respectively.

	$CLUSTER\%_{i,t}$			
	OLS REGRESSIONS		**CENSORED REGRESSIONS**	
	[1]	**[2]**	**[3]**	**[4]**
INTERCEPT	*0.291**** *(290.13)*	*0.495**** *(32.98)*	*0.455**** *(149.43)*	*0.640**** *(35.25)*
Δ FROM BIG4	*0.038**** *(8.56)*	*0.010**** *(2.39)*	*0.038**** *(8.56)*	*0.010**** *(2.39)*
LNPRICE		*0.024**** *(8.91)*		*0.024**** *(8.91)*
LNSIZE		*-0.018**** *(-16.85)*		*-0.018**** *(-16.86)*
B/M		*-0.001* *(-1.40)*		*-0.001* *(-1.40)*
MOMENTUM		*0.007**** *(6.13)*		*0.007**** *(6.13)*
SPREAD		*2.225**** *(6.86)*		*2.225**** *(6.86)*
TURNOVER		*-0.677**** *(-5.77)*		*-0.677**** *(-5.77)*
VOLATILITY		*-0.955**** *(-9.42)*		*-0.955**** *(-9.43)*
ILLIQUIDITY		*-0.001**** *(-2.83)*		*-0.001**** *(-2.83)*
Num of Obs	*23594*	*21849*	*23954*	*21849*
Adj. R^2/Pseudo R^2	*0.519*	*0.643*	*-0.431*	*-0.609*
Year Fixed Ef	*YES*	*YES*	*YES*	*YES*
Robust SEs	*YES*	*YES*	*YES*	*YES*

In contrast, Table 5 reports the relation between a firm-level increase in auditing quality (*ΔTo BIG4*) and price clustering. In columns [1] and [3], when only including the independent variable of interest, we find significantly negative coefficients suggesting that changing from a non-BIG4 auditor to a BIG4 auditor results in a significant reduction in price clustering. However, when estimating the full specification and including all of the control variable, the coefficient on *ΔTo BIG4* becomes indistinguishable from zero. These results indicate only very weak evidence that changes in auditing quality to a higher level are associated with reduced price clustering. A comparison of Table 4 and Table 5 indicates that price clustering is more sensitive to a decrease in auditing quality as compared to an increase in the auditing quality.

A possible explanation for this asymmetric pattern might be explained by "loss aversion" (Kahneman and Tversky, 1979). Here, according to our hypothesis, the asymmetric response in price clustering to changes in auditors suggests that reductions in auditor quality are treated differently than improvements in auditor quality. In these cases, price clustering increases for the former but is unchanged for the latter.

Table 5. Price Clustering and Changes in Auditor Quality
This table reports the results from estimating the following equation. We use both OLS and TOBIT specifications.

$$CLUSTER\%_{i,t} = \beta_0 + \beta_1 \Delta TO\ BIG4_{i,t} + \beta_2 LN(PRICE_{i,t}) + \beta_3 LN(SIZE_{i,t}) + \beta_4 {}^{B}/_{M_{i,t}} + \beta_5 MOMENTUM_{i,t} + \beta_6 SPREAD_{i,t} + \beta_7 TURNOVER_{i,t} + \beta_8 VOLATILITY_{i,t} + \beta_9 ILLIQUIDTY_{i,t} + \varepsilon_{i,t}$$

The dependent variable CLUSTER% is the total number of daily stock closing prices that clustered on $0.05 divided by the total number of days traded in that year. As independent variable, Δ TO BIG4 is an indicator variable that takes on value of one for a firm that changes from a non-Big4 auditor to a Big4 audit firm in the year, zero for benchmark firms that remain with non-BIG4 auditors For the definitions of control variables please refer to table 1. Corresponding robust t-statistics are reported in parentheses below each coefficient estimate. *, **, *** denote statistical significance at the 0.10, 0.05, and the 0.01 levels, respectively.

	$CLUSTER\%_{i,t}$			
	OLS REGRESSIONS		CENSORED REGRESSIONS	
	[1]	[2]	[3]	[4]
INTERCEPT	*0.337**** *(129.39)*	*0.660**** *(25.65)*	*0.486**** *(91.35)*	*0.817**** *(29.54)*
Δ *FROM BIG4*	*-0.035**** *(-5.62)*	*0.000* *(0.08)*	*-0.035**** *(-5.63)*	*0.000* *(0.08)*
LNPRICE		*0.031**** *(10.47)*		*0.031**** *(10.49)*
LNSIZE		*-0.031**** *(-13.93)*		*-0.031**** *(-13.95)*
B/M		*-0.004**** *(-2.59)*		*-0.004**** *(-2.60)*
MOMENTUM		*0.008**** *(5.19)*		*0.008**** *(5.20)*
SPREAD		*1.249**** *(6.05)*		*1.249**** *(6.06)*
TURNOVER		*-0.367*** *(-2.13)*		*-0.367*** *(-2.14)*
VOLATILITY		*-1.139**** *(-7.37)*		*-1.139**** *(-7.38)*
ILLIQUIDITY		*-0.001**** *(-5.26)*		*-0.001**** *(-5.27)*
Num of Obs	6443	6123	6443	6123
Adj. R^2/Pseudo R^2	*0.418*	*0.580*	*-0.394*	*-0.631*
Year Fixed Ef	*YES*	*YES*	*YES*	*YES*
Robust SEs	*YES*	*YES*	*YES*	*YES*

PRICE CLUSTERING AND AUDIT FEES

To further strengthen our hypothesis, we extend our model to test another key proxy of audit quality by examining audit fees. Prior literature holds competing views about the relationship between abnormal audit fees and audit quality. On the one hand, researchers view abnormal audit fees as an indication of greater auditor efforts and, thus, abnormal audit fees are positively associated with audit quality (Blankley et al. 2012; Higgs and Skantz 2006; Eshleman and Guo 2014). On the other hand, a stream of literature lends support to the argument that the level of abnormal audit fees represents bribes or economic rents earned by auditors suggesting an inverse relation to audit quality. In this study, we focus on testing the relationship between abnormal audit fees and price clustering. In doing so, we indirectly contribute to the debate about the relationship between audit fees and audit quality. We use the following equation to estimate the relation between abnormal audit fees and the stock price clustering:

$$CLUSTER\%_{i,t} = \beta_0 + \beta_1 LN(ABNORMAL\ AUDIT\ FEES_{i,t}) + \beta_2 LN(PRICE_{i,t}) + \beta_3 LN(SIZE_{i,t}) + \beta_4 {}^{B}/_{M_{i,t}} + \beta_5 MOMENTUM_{i,t} + \beta_6 SPREAD_{i,t} + \beta_7 TURNOVER_{i,t} + \beta_8 VOLATILITY_{i,t} + \beta_9 ILLIQUIDITY_{i,t} + \varepsilon_{i,t} \quad (4)$$

Table 6 reports the results from the estimation of Eq. (4) in which our main variable of interest, in this case, is abnormal audit fees. We use three abnormal audit fee measures (i.e., *ABSOLUTE ABNORMAL FEES, POSITIVE ABNORMAL FEES,* and *NEGATIVE ABNORMAL FEES*). In current study, we adopt the economic bonding view (Kinney and Libby 2002), we view the positive abnormal audit fees as quasi-rents arising from a highly profitable audit engagement. Such quasi-rents may lead the auditor to compromise their independence, in turn, reducing audit quality (Choi et al. 2010). Therefore, we expect *ABSOLUTE ABNORMAL FEES* and *POSITIVE ABNORMAL FEES* to be positively associated with price clustering. The negative abnormal fees suggest that the firm has a strong bargaining power (and hence is able to negotiate billing concessions). Such high client bargaining power may lead the auditor to succumb to client pressure for earnings management (Asthana and Boone 2012). Thus, the more *NEGATIVE ABNORMAL FEES*, the lower the audit quality. Since the mean value of *NEGATIVE ABNORMAL FEES* is negative, we expect *NEGATIVE ABNORMAL FEES* to be negatively associated with price clustering. Consistent with our hypothesis, the coefficients of *ABSOLUTE ABNORMAL FEES* in Columns [1] and [4] are positive and significant (coefficient = 0.008, $p < 0.05$). Similarly, the coefficients of *POSITIVE ABNORMAL FEES* in Columns [2] and [5] are positive and significant (coefficient = 0.007, $p < 0.01$). While the coefficients of *NEGATIVE ABNORMAL FEES* in Columns [3] and [6] are negative and significant (coefficient = -0.007, $p < 0.1$). In sum, our results seem to suggest that audit quality is directly associated with price clustering in financial markets.

Table 6. Price Clustering and Audit Fees
This table reports the results from estimating the following equation. We use both OLS and TOBIT (censored) regression specifications.

$$CLUSTER\%_{i,t} = \beta_0 + \beta_1 LN\left(ABNORMAL\ AUDIT\ FEES_{i,t}\right) + \beta_2 LN\left(PRICE_{i,t}\right) + \beta_3 LN\left(SIZE_{i,t}\right) + \beta_4 \, {}^{B}/_{M_{i,t}} + \beta_5 MOMENTUM_{i,t} + \beta_6 SPREAD_{i,t} + \beta_7 TURNOVER_{i,t} + \beta_8 VOLATILITY_{i,t} + \beta_9 ILLIQUIDITY_{i,t} + \varepsilon_{i,t}$$

The dependent variable CLUSTER% is the total number of daily stock closing prices that clustered on $0.05 divided by the total number of days traded in that year. As independent variables, *ABSOLUTE ABNORMAL FEES* are the absolute value of the residual of normal audit fee determination model. *POSITIVE ABNORMAL FEES* are the positive residual of normal audit fee determination model. *NEGATIVE ABNORMAL FEES* are the negative residual of the normal audit fee determination model. For the definitions of control variables please refer to table 1. Corresponding robust t-statistics are reported in parentheses below each coefficient estimate. *, **, *** denote statistical significance at the 0.10, 0.05, and the 0.01 levels, respectively.

	CLUSTER%$_{i,t}$					
	OLS REGRESSIONS			**CENSORED REGRESSIONS**		
	[1]	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**
INTERCEPT	*0.395**** *(30.57)*	*0.381**** *(37.99)*	*0.406**** *(21.61)*	*0.395**** *(30.57)*	*0.381**** *(38.01)*	*0.406**** *(21.63)*
ABSOLUTE ABNORMAL FEES	*0.008*** *(2.40)*			*0.008*** *(2.40)*		
POSITIVE ABNORMAL FEES		*0.007**** *(2.94)*			*0.007**** *(2.94)*	
NEGATIVE ABNORMAL FEES			*-0.007** *(-1.85)*			*-0.007** *(-1.85)*
LNPRICE	*0.018**** *(7.82)*	*0.014**** *(10.49)*	*0.021**** *(5.21)*	*0.018**** *(7.82)*	*0.014**** *(10.50)*	*0.021**** *(5.21)*
LNSIZE	*-0.014**** *(-13.94)*	*-0.012**** *(-15.09)*	*-0.015**** *(-9.81)*	*-0.014**** *(-13.95)*	*-0.012**** *(-15.09)*	*-0.015**** *(-9.82)*
B/M	*-0.002*** *(-2.22)*	*-0.002* *(-1.21)*	*-0.002*** *(-2.18)*	*-0.002*** *(-2.22)*	*-0.002* *(-1.21)*	*-0.002*** *(-2.18)*
MOMENTUM	*0.002* *(1.50)*	*0.002** *(1.85)*	*0.001* *(0.63)*	*0.002* *(1.50)*	*0.002** *(1.85)*	*0.001* *(0.63)*
SPREAD	*2.195**** *(7.18)*	*2.570**** *(8.37)*	*1.900**** *(5.31)*	*2.195**** *(7.18)*	*2.570**** *(8.37)*	*1.900**** *(5.31)*
TURNOVER	*-0.523**** *(-5.34)*	*-0.575**** *(-5.65)*	*-0.487**** *(-3.72)*	*-0.523**** *(-5.34)*	*-0.575**** *(-5.65)*	*-0.487**** *(-3.72)*
VOLATILITY	*-0.344**** *(-5.13)*	*-0.391**** *(-5.46)*	*-0.292*** *(-2.38)*	*-0.344**** *(-5.13)*	*-0.391**** *(-5.46)*	*-0.292*** *(-2.38)*
ILLIQUIDITY	*-0.001**** *(-5.55)*	*-0.001**** *(-6.65)*	*-0.001**** *(-3.36)*	*-0.001**** *(-5.55)*	*-0.001**** *(-6.65)*	*-0.001**** *(-3.36)*
BIG4	*0.003* *(1.43)*	*-0.007**** *(-3.5)*	*-0.003* *(-0.80)*	*0.003* *(1.43)*	*-0.007**** *(-3.5)*	*-0.003* *(-0.80)*
Num of Obs	*19213*	*10136*	*9077*	*19213*	*10136*	*9077*
Adj. R^2/Pseudo R^2	*0.222*	*0.232*	*0.218*	*-0.095*	*-0.095*	*-0.099*
Year Fixed Ef	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*
Robust SEs	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*

PRICE CLUSTERING AND CHANGES IN AUDIT FEES

In the previous table we used the level of abnormal audit fees as an explanatory variable. Here, we look at the relationship between changes in the abnormal audit fee and the level of price clustering. A positive change in *ABSOLUTE ABNORMAL FEES* coincides with an increase in deviation of normal audit fees. Hence, a higher absolute abnormal fee residual represents lower accounting information quality (Choi et al. 2010). Therefore, we expect a positive relation between *ΔABSOLUTE ABNORMAL FEES* and price clustering. Similarly, a positive change in *POSITIVE ABNORMAL FEES* captures more excessive rents that an auditor can charge the auditee. Therefore, we also expect a positive relationship between *ΔPOSITIVE ABNORMAL FEES* and price clustering. A negative change in *NEGATIVE ABNORMAL FEES* (i.e., become more negative) captures stronger auditees' bargaining power, which is provided as evidence of lower audit quality (Asthana and Boone 2012). Therefore, we expect a negative relationship between *ΔNEGATIVE ABNORMAL FEES* and price clustering. We estimate the following equation:

$$CLUSTER\%_{i,t} = \beta_0 + \beta_1 \Delta ABNORMAL\ AUDITFEES_{i,t} + \beta_2 LN(PRICE_{i,t}) + \beta_3 LN(SIZE_{i,t}) + \beta_4\, {}^{B}/_{M_{i,t}} + \beta_5 MOMENTUM_{i,t} + \beta_6 SPREAD_{i,t} + \beta_7 TURNOVER_{i,t} + \beta_8 VOLATILITY_{i,t} + \beta_9 ILLIQUIDITY_{i,t} + \varepsilon_{i,t} \quad (5)$$

The results from estimating Eq. (5) are reported in Table 7. As per our hypothesis, the coefficients on the *ΔABSOLUTE ABNORMAL FEES* in Column [1] and Column [4] are positive and significant at 5 percent level. In Columns [2] and [5], the coefficients on the ΔPOSITIVE *ABNORMAL FEES* is positive and significant at the 0.01 level. We do not find a significant negative relationship between the change in negative abnormal audit fees and price clustering, nevertheless, the findings of *ΔABSOLUTE ABNORMAL FEES* and *ΔPOSITIVE ABNORMAL FEES* complement our earlier results and seem to confirm our hypothesis that a decrease in audit quality leads to a decrease in accounting information quality which subsequently leads to an increase in the clustering of stock prices.

Table 7. Price Clustering and Changes in Abnormal Audit Fees
This table reports the results from estimating the following equation. We use OLS and TOBIT (censored) regression specifications.

$$CLUSTER\%_{i,t} = \beta_0 + \beta_1 \Delta ABNORMAL\ AUDITFEES_{i,t} + \beta_2 LN(PRICE_{i,t}) + \beta_3 LN(SIZE_{i,t}) + \beta_4 {}^{B}/_{M_{i,t}} + \beta_5 MOMENTUM_{i,t} + \beta_6 SPREAD_{i,t} + \beta_7 TURNOVER_{i,t} + \beta_8 VOLATILITY_{i,t} + \beta_9 ILLIQUIDITY_{i,t} + \varepsilon_{i,t}$$

The dependent variable *CLUSTER%* is the total number of daily stock closing prices that clustered on $0.05 divided by the total number of days traded in that year. As independent variables, *Δ ABSOLUTE ABNORMAL AUDITFEES* are the difference of the absolute value of the abnormal audit fees from period of t-1 to t. *Δ POSITIVE ABNORMAL AUDITFEES* are the difference of the positive abnormal audit fees from period of t-1 to t. *Δ NEGATIVE ABNORMAL AUDITFEES* are the difference of the negative abnormal audit fees from period of t-1 to t. For the definitions of control variables please refer to table 1. Corresponding robust t-statistics are reported in parentheses below each coefficient estimate. *, **, *** denote statistical significance at the 0.10, 0.05, and the 0.01 levels, respectively.

	CLUSTER%$_{i,t}$					
	OLS REGRESSIONS			**CENSORED REGRESSIONS**		
	[1]	[2]	[3]	[4]	[5]	[6]
INTERCEPT	*0.359**** *(28.93)*	*0.347**** *(34.60)*	*0.362**** *(18.32)*	*0.359**** *(28.94)*	*0.347**** *(34.62)*	*0.362**** *(18.34)*
Δ ABSOLUTE ABNORMAL FEES	*0.003*** *(1.96)*			*0.003*** *(1.96)*		
Δ POSITIVE ABNORMAL FEES		*0.008**** *(2.63)*			*0.008**** *(2.63)*	
Δ NEGATIVE ABNORMAL FEES			*-0.003* *(-1.34)*			*-0.003* *(-1.34)*
LNPRICE	*0.016**** *(7.11)*	*0.011**** *(8.69)*	*0.021**** *(4.45)*	*0.016**** *(7.11)*	*0.011**** *(8.69)*	*0.021**** *(4.45)*
LNSIZE	*-0.011**** *(-11.62)*	*-0.010**** *(-12.26)*	*-0.012**** *(-7.38)*	*-0.011**** *(-11.62)*	*-0.010**** *(-12.26)*	*-0.012**** *(-7.38)*
B/M	*-0.001* *(-1.64)*	*-0.001* *(-1.05)*	*-0.001* *(-1.63)*	*-0.001* *(-1.64)*	*-0.001* *(-1.05)*	*-0.001* *(-1.63)*
MOMENTUM	*-0.001* *(-0.58)*	*0.002* *(1.33)*	*-0.005*** *(-2.02)*	*-0.001* *(-0.58)*	*0.002* *(1.33)*	*-0.005*** *(-2.03)*
SPREAD	*2.012**** *(6.56)*	*2.248**** *(7.55)*	*1.604**** *(4.32)*	*2.012**** *(6.56)*	*2.248**** *(7.55)*	*1.604**** *(4.33)*
TURNOVER	*-0.540**** *(-6.24)*	*-0.568**** *(-5.81)*	*-0.721**** *(-5.33)*	*-0.540**** *(-6.24)*	*-0.568**** *(-5.81)*	*-0.721**** *(-5.33)*
VOLATILITY	*-0.132*** *(-2.03)*	*-0.229**** *(-3.30)*	*0.102* *(0.64)*	*-0.132*** *(-2.03)*	*-0.229**** *(-3.31)*	*0.102* *(0.64)*
ILLIQUIDITY	*-0.001**** *(-5.28)*	*-0.001**** *(-5.47)*	*-0.001**** *(-3.05)*	*-0.001**** *(-5.28)*	*-0.001**** *(-5.47)*	*-0.001**** *(-3.05)*
BIG4	*-0.002* *(-0.92)*	*0.003* *(1.44)*	*-0.011**** *(-2.71)*	*-0.002* *(-0.92)*	*0.003* *(1.44)*	*-0.011**** *(-2.71)*
Num of Obs	*16162*	*7180*	*6394*	*16162*	*7180*	*6394*
Adj. R^2/Pseudo R^2	*0.230*	*0.251*	*0.226*	*-0.092*	*-0.094*	*-0.096*
Year Fixed Ef	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*
Robust SEs	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*

PRICE CLUSTERING AND DISCRETIONARY ACCRUALS

In previous sections, we have identified a robust relation between audit quality and price clustering. However, until this point, we have assumed that a higher audit quality can translate into better accounting information quality, which in turn partially explains price clustering. In this section, we look specifically at one of our proxies for accounting information quality: accrual earnings management. We use two different methods to compute discretionary accruals. First, following Dechow et al. (1995), we apply a modified Jones model to calculate the level of discretionary accruals (*D_ACCRUALS_DSS*). Second, we use a performance-matched discretionary accrual (*D_ACCRUALS_KLW*) measure following Kothari et al. (2005). Both measures represent aggressiveness of the firm's accounting practices and provide a signal regarding earnings management. We take the absolute value of both measures since we are interested in the magnitude rather than the direction of earnings management. A high absolute value of discretionary accruals represents a high level of earnings management, which, in turn, translates into a higher information asymmetry and leads to increased uncertainty in financial markets. According to our hypothesis, this increased uncertainty induces higher information acquisition costs, which can cause prices to cluster more frequently on round increments. In our next set of tests, we estimate the following equation:

$$CLUSTER\%_{i,t} = \beta_0 + \beta_1 DISCRETIONARY\ ACCRUALS_{i,t} + \beta_2 LN(PRICE_{i,t}) + \beta_3 LN(SIZE_{i,t}) + \beta_4 {}^{B}/_{M_{i,t}} + \beta_5 MOMENTUM_{i,t} + \beta_6 SPREAD_{i,t} + \beta_7 TURNOVER_{i,t} + \beta_8 VOLATILITY_{i,t} + \beta_9 ILLIQUIDITY_{i,t} + \varepsilon_{i,t} \quad (6)$$

Columns [1] and [3] in Table 8 report the results from the estimation of the OLS regressions (Eq. (6)) while Columns [5] and [7] report the results from the Tobit regressions by using *D_ACCRUALS_KLW* as the independent variable. Columns [2] and [4] report the results from the estimation of OLS regressions (Eq. (6)), while Columns [6] and [8] report the results from Tobit regressions by using *D_ACCRUALS_DSS* as the independent variable. When the independent variable is *D_ACCRUAL_KLW* in the baseline and the full specification (Columns [1] and [3]), the coefficients are positive and significant. The coefficient in Column [3] is 0.014 ($p < 0.01$). Likewise, when the independent variable is *D_ACCRUALS_DSS* in the baseline and full specification (Columns [2] and [4]), the coefficients are significantly positive. The coefficient in Column [4] is 0.017 ($p < 0.01$), which suggests that a one-SD increase in absolute discretionary accrual is associated with an increase of stock price clustering by about 76 basis points. These results further reaffirm our hypothesis by showing that financial reporting quality directly impacts the clustering of stock prices.

Table 8. Price Clustering and Discretionary Accruals
This table reports the results from estimating the following equation. We use both OLS and TOBIT (censored) regression specifications.

$$CLUSTER\%_{i,t} = \beta_0 + \beta_1 DISCRETIONARY\ ACCRUALS_{i,t} + \beta_2 LN(PRICE_{i,t}) + \beta_3 LN(SIZE_{i,t}) + \beta_4 \, {}^{B}/_{M_{i,t}} + \beta_5 MOMENTUM_{i,t} + \beta_6 SPREAD_{i,t} + \beta_7 TURNOVER_{i,t} + \beta_8 VOLATILITY_{i,t} + \beta_9 ILLIQUIDITY_{i,t} + \varepsilon_{i,t}$$

The dependent variable CLUSTER% is the total number of daily stock closing prices that clustered on $0.05 divided by the total number of days traded in that year. As independent variables, *D_ACCRUALS_DSS* are the absolute value of discretionary accrual calculated by using modified Jones model created by Dechow, Sloan, and Sweeney (1995). *D_ACCRUALS_KLW* is the absolute value of discretionary accrual calculated by following Kothari et al. (2005). For the definitions of control variables please refer to table 1. Corresponding robust t-statistics are reported in parentheses below each coefficient estimate. *, **, *** denote statistical significance at the 0.10, 0.05, and the 0.01 levels, respectively.

				$CLUSTER\%_{i,t}$				
	OLS REGRESSIONS				**CENSORED REGRESSIONS**			
	[1]	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**	**[8]**
INTERCEPT	*0.467**** *(54.15)*	*0.470**** *(46.29)*	*0.662**** *(26.01)*	*0.683**** *(28.90)*	*0.467**** *(54.23)*	*0.470**** *(46.35)*	*0.662**** *(26.05)*	*0.683**** *(28.94)*
D_ACCRUALS _KLW	*0.016**** *(4.24)*		*0.014**** *(4.38)*		*0.016**** *(4.24)*		*0.014**** *(4.39)*	
D_ACCRUALS _DSS		*0.015**** *(4.24)*		*0.017**** *(5.27)*		*0.015**** *(4.24)*		*0.017**** *(5.28)*
LNPRICE			*0.023**** *(11.32)*	*0.025**** *(11.55)*			*0.023**** *(11.34)*	*0.025**** *(11.57)*
LNSIZE			*-0.021**** *(-19.66)*	*-0.021**** *(-20.75)*			*-0.021**** *(-19.70)*	*-0.021**** *(-20.78)*
B/M			*-0.001*** *(-2.06)*	*-0.002**** *(-2.75)*			*-0.001*** *(-2.06)*	*-0.002**** *(-2.75)*
MOMENTUM			*0.007**** *(7.71)*	*0.008**** *(8.33)*			*0.007**** *(7.72)*	*0.008**** *(8.34)*
SPREAD			*2.032**** *(9.17)*	*1.989**** *(10.08)*			*2.032**** *(9.19)*	*1.989**** *(10.10)*
TURNOVER			*-0.512**** *(-5.06)*	*-0.558**** *(-5.27)*			*-0.512**** *(-5.06)*	*-0.558**** *(-5.27)*
VOLATILITY			*-1.046**** *(-12.20)*	*-1.111**** *(-12.88)*			*-1.046**** *(-12.21)*	*-1.111**** *(-12.90)*
ILLIQUIDITY			*-0.001**** *(-5.42)*	*-0.001**** *(-5.54)*			*-0.001**** *(-5.42)*	*-0.001**** *(-5.55)*
Num of Obs	*27598*	*29945*	*25683*	*27881*	*27598*	*29945*	*25683*	*27881*
Adj. R^2/Pseudo R^2	*0.465*	*0.488*	*0.621*	*0.638*	*-0.367*	*-0.420*	*-0.572*	*-0.639*
Year Fixed Ef	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*
Robust SEs	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*

PRICE CLUSTERING AND BENEISH MSCORE

Another measure of accounting information quality used in this paper is the Beneish manipulation score (*MSCORE*), which proxies for the extent of earnings manipulation. We propose that firms with a high *MSCORE* are those with very low-quality accounting information. We expect that a high level of *MSCORE* is associated with a high level of price clustering as follows:

$$CLUSTER\%_{i,t} = \beta_0 + \beta_1 MSCORE_{i,t} + \beta_2 LN(PRICE_{i,t}) + \beta_3 LN(SIZE_{i,t}) + \beta_4 {}^{B}/_{M_{i,t}} + \beta_5 MOMENTUM_{i,t} + \beta_6 SPREAD_{i,t} + \beta_7 TURNOVER_{i,t} + \beta_8 VOLATILITY_{i,t} + \beta_9 ILLIQUIDITY_{i,t} + \varepsilon_{i,t} \quad (7)$$

Table 9 presents the results from the Eq. (7) estimation. Columns [1] and [2] show the results of the baseline and full specifications from the OLS model. All the regression specifications yield a positive and significant coefficient on *MSCORE*, which supports our hypothesis predictions. In Column, [2] the coefficient on *MSCORE* is positive (coefficient = 0.002, $p < 0.01$). The positive association between *MSCORE* and *CLUSTER%* indicates that accounting manipulation leads stock prices to cluster more often.

Table 9. Price Clustering and Beneish (1999) MSCORE

This table reports the results from estimating the following equation. We use both OLS and TOBIT (censored) regression specifications.

$$CLUSTER\%_{i,t} = \beta_0 + \beta_1 MSCORE_{i,t} + \beta_2 LN(PRICE_{i,t}) + \beta_3 LN(SIZE_{i,t}) + \beta_4 {}^{B}/_{M_{i,t}} + \beta_5 MOMENTUM_{i,t} + \beta_6 SPREAD_{i,t} + \beta_7 TURNOVER_{i,t} + \beta_8 VOLATILITY_{i,t} + \beta_9 ILLIQUIDITY_{i,t} + \varepsilon_{i,t}$$

The dependent variable *CLUSTER%* is the total number of daily stock closing prices that clustered on $0.05 divided by the total number of days traded in that year. As independent variable, *MSCORE* is the earnings manipulation score of Beneish (1999). For the definitions of control variables please refer to table 1. Corresponding robust t-statistics are reported in parentheses below each coefficient estimate. *, **, *** denote statistical significance at the 0.10, 0.05, and the 0.01 levels, respectively..

	CLUSTER%$_{i,t}$			
	OLS REGRESSIONS		**CENSORED REGRESSIONS**	
	[1]	**[2]**	**[3]**	**[4]**
INTERCEPT	*0.304**** *(203.90)*	*0.546**** *(36.81)*	*0.469**** *(148.05)*	*0.700**** *(41.19)*
MSCORE	*0.002**** *(4.56)*	*0.002**** *(5.20)*	*0.002**** *(4.56)*	*0.002**** *(5.20)*
LNPRICE		*0.021**** *(11.19)*		*0.021**** *(11.20)*
LNSIZE		*-0.020**** *(-19.50)*		*-0.020**** *(-19.51)*
B/M		*-0.002* *(-1.34)*		*-0.002* *(-1.34)*
MOMENTUM		*0.008**** *(8.62)*		*0.008**** *(8.63)*
SPREAD		*1.962**** *(9.65)*		*1.962**** *(9.65)*
TURNOVER		*-0.476**** *(-4.51)*		*-0.476**** *(-4.51)*
VOLATILITY		*-1.236**** *(-13.12)*		*-1.236**** *(-13.12)*
ILLIQUIDITY		*-0.001**** *(-5.56)*		*-0.001**** *(-5.56)*
Num of Obs	*24993*	*23209*	*24993*	*23209*
Adj. R^2/Pseudo R^2	*0.480*	*0.637*	*-0.401*	*-0.623*
Year Fixed Ef	*YES*	*YES*	*YES*	*YES*
Robust SEs	*YES*	*YES*	*YES*	*YES*

PRICE CLUSTERING AND ALL ACCOUNTING VARIABLES

We next attempt to investigate all the accounting and audit variables together (i.e., BIG4, ABSOLUTE ABNORMAL FEES, DISCRETIONARY ACCRUALS, and the MSCORE). We estimate the following equation using our sample of firm-year observations:

$$
\begin{aligned}
CLUSTER\%_{i,t} = {} & \beta_0 + \beta_1 BIG4_{i,t} + \beta_2 LN\left(ABNORMAL\ AUDITFEES_{i,t}\right) \\
& + \beta_3 DISCRETIONARY\ ACCRUALS_{i,t} + \beta_4 MSCORE_{i,t} + \beta_5 LN\left(PRICE_{i,t}\right) + \beta_6 LN\left(SIZE_{i,t}\right) \\
& + \beta_7 {}^{B}/_{M_{i,t}} + \beta_8 MOMENTUM_{i,t} + \beta_9 SPREAD_{i,t} + \beta_{10} TURNOVER_{i,t} + \beta_{11} VOLATILITY_{i,t} \\
& + \beta_{12} ILLIQUIDITY_{i,t} + \varepsilon_{i,t} \ (8)
\end{aligned}
$$

Table 10 presents the results from the Eq. (10) estimation. All of the variables of interest have statistically significant coefficients and possess the correct expected signs with one exception. We do not find a significant estimate on abnormal audit fees. In Column [2], the coefficients obtained via the full-specification OLS regression show that *BIG4* has a negative coefficient of -0.008 ($p<0.01$); *D_ACCRUAL_DSS* produces a positive coefficient of 0.022 ($p < 0.01$); and *MSCORE* also has a positive coefficient of 0.001 ($p < 0.05$). The coefficients in both Columns [2] and [4] are similar in sign and generally similar in magnitude to the corresponding coefficients in previous tables. In sum, these results indicate that firms with auditors of lower reputations, more discretionary accruals, and a higher *MSCORE* generally have stocks with more price clustering. These results support our hypothesis that the quality of accounting information helps explain, in part, the anomalous level of price clustering observed in financial markets.[12]

[12] In a series of unreported tests, we replicate our analysis including both year- and firm fixed effects. We initially excluded firm-fixed effects since our indicator variable capturing Big 4 Auditors has very little variation across time for some stocks. In general, we find that the results reported in each of the tables hold when including firm-fixed effects. As expected, the main difference occurs when we include both firm fixed effects and BIG4 as the estimate on BIG4 significantly decreases.

Table 10. Price Clustering and All Accounting Variables
The table reports the results from estimating the following equation. We use both OLS and TOBIT specifications.

$$CLUSTER\%_{i,t} = \beta_0 + \beta_1 BIG4_{i,t} + \beta_2 LN(ABNORMAL\ AUDITFEES_{i,t}) + \beta_3 DISCRETIONARY\ ACCRUALS_{i,t} + \beta_4 MSCORE_{i,t} + \beta_5 LN(PRICE_{i,t}) + \beta_6 LN(SIZE_{i,t}) + \beta_7 {}^{B}/_{M_{i,t}} + \beta_8 MOMENTUM_{i,t} + \beta_9 SPREAD_{i,t} + \beta_{10} TURNOVER_{i,t} + \beta_{11} VOLATILITY_{i,t} + \beta_{12} ILLIQUIDITY_{i,t} + \varepsilon_{i,t}$$

The dependent variable *CLUSTER%* is the total number of daily stock closing prices that clustered on $0.05 divided by the total number of days traded in that year. As independent variables, BIG4 is an indicator variable that takes on value of one for a firm that has obtain auditing services during that year from one of the four largest accounting firms, zero otherwise. LN (*ABSOLUTE ABNORMAL FEES)* is the natural log of are the absolute value of the residual of normal audit fee determination model*. D_ACCRUALS_DSS* are the absolute value of discretionary accrual calculated via Modified Jones model created by Dechow et al. (1995). *MSCORE* is a measure of earning manipulation calculated using method of Beneish (1999). For the definitions of control variables please refer to table 1. Corresponding robust t-statistics are reported in parentheses below each coefficient estimate. *, **, *** denote statistical significance at the 0.10, 0.05, and the 0.01 levels, respectively.

	CLUSTER%$_{i,t}$			
	OLS REGRESSIONS		**CENSORED REGRESSIONS**	
	[1]	**[2]**	**[3]**	**[4]**
INTERCEPT	*0.285**** *(101.83)*	*0.392**** *(24.61)*	*0.361**** *(104.10)*	*0.464**** *(29.26)*
BIG4	*-0.038**** *(-15.29)*	*-0.008**** *(-3.83)*	*-0.038**** *(-15.30)*	*-0.008**** *(-3.83)*
D_ACCRUALS_DSS	*0.018**** *(3.44)*	*0.022**** *(4.31)*	*0.018**** *(3.44)*	*0.022**** *(4.31)*
ABSOLUTE ABNORMAL FEES	*-0.002* *(-0.84)*	*-0.002* *(-0.67)*	*-0.002* *(-0.84)*	*-0.002* *(-0.67)*
MSCORE	*0.000* *(1.00)*	*0.001*** *(2.17)*	*0.000* *(1.00)*	*0.001*** *(2.18)*
LNPRICE		*0.015**** *(9.07)*		*0.015**** *(9.08)*
LNSIZE		*-0.012**** *(-12.51)*		*-0.012**** *(-12.52)*
B/M		*-0.001* *(-0.81)*		*-0.001* *(-0.81)*
MOMENTUM		*0.005**** *(5.35)*		*0.005**** *(5.35)*
SPREAD		*2.108**** *(6.58)*		*2.108**** *(6.59)*
TURNOVER		*-0.476**** *(-5.00)*		*-0.476**** *(-5.01)*
VOLATILITY		*-0.515**** *(-5.24)*		*-0.515**** *(-5.24)*
ILLIQUIDITY		*-0.001**** *(-4.88)*		*-0.001**** *(-4.89)*
Num of Obs	*17371*	*16075*	*17371*	*16075*
Adj. R^2/Pseudo R^2	*0.238*	*0.414*	*-0.101*	*-0.198*
Year Fixed Ef	*YES*	*YES*	*YES*	*YES*
Robust SEs	*YES*	*YES*	*YES*	*YES*

CONCLUSION

Among the many peculiar findings in financial markets, perhaps none have broader implications than the tendency of stocks to cluster on round prices. Given the general role that prices play in revealing information to market participants (Hayek, 1945; Friedman, 1977), price clustering, which has been documented in commodity, bond, and equity markets, questions the informational efficiency of stock prices in financial markets. While much of the literature has attempted to document the presence of clustering, fewer studies have sought to explain the factors that determine the level of clustering. Harris (1991) finds support for the argument that price clustering occurs because traders are willing to settle on round prices to avoid the costs of further negotiations. These costs are likely a function of the time it takes to further negotiate as well as the costs associated with acquiring more granular information. Our study develops and tests the hypothesis that accounting information quality influences the degree of price clustering. To the extent that lower-quality accounting information generates uncertainty that raises the costs of acquiring new information, stocks will tend to cluster more on round prices.

We conduct a series of multivariate tests in which we attempt to determine whether price clustering is explained by poor accounting information that we proxied with poor audit quality and earnings management/manipulation. Results show strong evidence that poor accounting information partly explains the unusual level of price clustering in financial markets. These results are both statistically significant and economically meaningful. Our results are also robust to a number of different accounting measures that capture poor audit quality and the management/manipulation of earnings. The findings from our study have broad implications and highlight the importance that accounting information plays in the pricing of securities and the overall efficiency of financial markets.

REFERENCES

Ahn, H. J., Cai, J., & Cheung, Y. L. (2005). Price clustering on the limit-order book: Evidence from the Stock Exchange of Hong Kong. *Journal of Financial Markets*, *8*(4), 421-451.

Alexander, G. J., & Peterson, M. A. (2007). An analysis of trade-size clustering and its relation to stealth trading. *Journal of Financial Economics*, *84*(2), 435-471.

Amihud, Y. (2002). Illiquidity and stock returns: cross-section and time-series effects. *Journal of Financial Markets*, *5*(1), 31-56.

Ap Gwilym, O., Clare, A., & Thomas, S. (1998). Extreme price clustering in the London equity index futures and options markets. *Journal of Banking & Finance*, *22*(9), 1193-1206.

Asthana, S. C., & Boone, J. P. (2012). Abnormal audit fee and audit quality. *Auditing: A Journal of Practice & Theory*, *31*(3), 1-22.

Baig, A. S., & Sabah, N. (2019). Does short selling affect the clustering of stock prices?. *The Quarterly Review of Economics and Finance*.

Ball, C. A., Torous, W. N., & Tschoegl, A. E. (1985). The degree of price resolution: The case of the gold market. *Journal of Futures Markets*, *5*(1), 29-43.

Bartov, E., Gul, F. A., & Tsui, J. S. (2000). Discretionary-accruals models and audit qualifications. *Journal of Accounting and Economics*, *30*(3), 421-452.

Becker, C. L., DeFond, M. L., Jiambalvo, J., & Subramanyam, K. R. (1998). The effect of audit quality on earnings management. *Contemporary Accounting Research*, *15*(1), 1-24.

Behn, B. K., Choi, J. H., & Kang, T. (2008). Audit quality and properties of analyst earnings forecasts. *The Accounting Review*, *83*(2), 327-349.

Beneish, M. D. (1999). The detection of earnings manipulation. *Financial Analysts Journal*, *55*(5), 24-36.

Beneish, M. D., Lee, C. M., & Nichols, D. C. (2013). "Earnings Manipulation and Expected Returns": Author Response. *Financial Analysts Journal*, *69*(5), 14-14.

Bessembinder, H. (1999). Trade execution costs on Nasdaq and the NYSE: A post-reform comparison. *Journal of Financial and Quantitative Analysis*, *34*(3), 387-407.

Blankley, A. I., Hurtt, D. N., & MacGregor, J. E. (2012). Abnormal audit fees and restatements. *Auditing: A Journal of Practice & Theory*, *31*(1), 79-96.

Blau, B. M. (2019). Price clustering and investor sentiment. *Journal of Behavioral Finance*, *20*(1), 19-30.

Blau, B. M., & Griffith, T. G. (2016). Price clustering and the stability of stock prices. *Journal of Business Research*, *69*(10), 3933-3942.

Blau, B. M., Van Ness, B. F., & Van Ness, R. A. (2012). Trade size and price clustering: The case of short sales and the suspension of price tests. *Journal of Financial Research*, *35*(2), 159-182.

Bradley, D. J., Cooney, J. W., Jordan, B. D., & Singh, A. K. (2004). Negotiation and the IPO offer price: A comparison of integer vs. non-integer IPOs. *Journal of Financial and Quantitative Analysis*, *39*(3), 517-540.

Chiao, C., & Wang, Z. M. (2009). Price clustering: Evidence using comprehensive limit-order data. *Financial Review*, *44*(1), 1-29.

Choi, J. H., Kim, J. B., & Zang, Y. (2010). Do abnormally high audit fees impair audit quality?. *Auditing: A Journal of Practice & Theory*, *29*(2), 115-140.

Cohen, D. A., & Zarowin, P. (2010). Accrual-based and real earnings management activities around seasoned equity offerings. *Journal of Accounting and Economics*, *50*(1), 2-19.

DeAngelo, L. E. (1981). Auditor size and audit quality. *Journal of Accounting and Economics*, *3*(3), 183-199.

Dechow, P. M., Sloan, R. G., & Sweeney, A. P. (1995). Detecting earnings management. *The Accounting review*, 193-225.

DeFond, M. L., Lim, C. Y., & Zang, Y. (2016). Client conservatism and auditor-client contracting. *The Accounting Review*, *91*(1), 69-98.

DeFond, M. L., Raghunandan, K., & Subramanyam, K. R. (2002). Do non-audit service fees impair auditor independence? Evidence from going concern audit opinions. *Journal of Accounting Research*, 1247-1274.

Dodd, P., Dopuch, N., Holthausen, R., & Leftwich, R. (1984). Qualified audit opinions and stock prices: Information content, announcement dates, and concurrent disclosures. *Journal of Accounting and Economics*, *6*(1), 3-38.

Doogar, R., Sivadasan, P., & Solomon, I. (2015). Audit fee residuals: Costs or rents?. *Review of Accounting Studies*, *20*(4), 1247-1286.

Dopuch, N., & Simunic, D. (1980). The nature of competition in the auditing profession: a descriptive and normative view. *Regulation and the Accounting Profession*, *34*(2), 283-289.

Dopuch, N., & Simunic, D. (1982, June). Competition in auditing: An assessment. In *Fourth Symposium on Auditing Research* (Vol. 401, p. 405). Urbana, IL: University of Illinois.

Eshleman, J. D., & Guo, P. (2014). Abnormal audit fees and audit quality: The importance of considering managerial incentives in tests of earnings management. *Auditing: A Journal of Practice & Theory*, *33*(1), 117-138.

Foster, N. (2003). The FASB and the capital markets. *The FASB Report (June 2003)*.

Francis, J. R. (2004). What do we know about audit quality?. *The British Accounting Review*, *36*(4), 345-368.

Francis, J. R., & Wilson, E. R. (1988). Auditor changes: A joint test of theories relating to agency costs and auditor differentiation. *The Accounting Review*, 663-682.

Francis, J., LaFond, R., Olsson, P., & Schipper, K. (2005). The market pricing of accruals quality. *Journal of Accounting and Economics*, *39*(2), 295-327.

Friedman, M. (1977). Nobel lecture: inflation and unemployment. *Journal of Political Economy*, *85*(3), 451-472.

Gul, F. A., Kim, J. B., & Qiu, A. A. (2010). Ownership concentration, foreign shareholding, audit quality, and stock price synchronicity: Evidence from China. *Journal of Financial Economics*, *95*(3), 425-442.

Hameed, A., & Terry, E. (1998). The effect of tick size on price clustering and trading volume. *Journal of Business Finance & Accounting*, *25*(7-8), 849-867.

Harris, L. (1991). Stock price clustering and discreteness. *The Review of Financial Studies*, *4*(3), 389-415.

Hayek, F. A. (1945). The use of knowledge in society. *The American Economic Review*, *35*(4), 519-530.

Higgs, J. L., & Skantz, T. R. (2006). Audit and nonaudit fees and the market's reaction to earnings announcements. *Auditing: A Journal of Practice & Theory*, *25*(1), 1-26.

Hope, O. K., & Langli, J. C. (2010). Auditor independence in a private firm and low litigation risk setting. *The Accounting Review*, *85*(2), 573-605.

Ikenberry, D. L., & Weston, J. P. (2008). Clustering in US stock prices after decimalisation. *European Financial Management*, *14*(1), 30-54.

Iliev, P. (2010). The effect of SOX Section 404: Costs, earnings quality, and stock prices. *The Journal of Finance*, *65*(3), 1163-1196.

Jones, K. L., Krishnan, G. V., & Melendrez, K. D. (2008). Do models of discretionary accruals detect actual cases of fraudulent and restated earnings? An empirical analysis. *Contemporary Accounting Research*, *25*(2), 499-531.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, *47*(2), 263-291.

Kinney, W. R., & Libby, R. (2002). The relation between auditors' fees for nonaudit services and earnings management: Discussion. *The Accounting Review*, *77*, 107-114.

Kothari, Sagar P., Andrew J. Leone, and Charles E. Wasley. "Performance matched discretionary accrual measures." *Journal of accounting and economics* 39.1 (2005): 163-197.

Larcker, D. F., & Richardson, S. A. (2004). Fees paid to audit firms, accrual choices, and corporate governance. *Journal of Accounting Research*, *42*(3), 625-658.

Lawrence, A., Minutti-Meza, M., & Zhang, P. (2011). Can Big 4 versus non-Big 4 differences in audit-quality proxies be attributed to client characteristics?. *The Accounting review*, *86*(1), 259-286.

Levitt Jr, A. (1998). The numbers game. *The CPA Journal*, *68*(12), 14.

Loudder, M. L., Khurana, I. K., Sawyers, R. B., Cordery, C., Johnson, C., Lowe, J., & Wunderle, R. (1992). The information content of audit qualifications. *Auditing*, *11*(1), 69.

Malkiel, B. G., & Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *The journal of Finance*, *25*(2), 383-417.

Ni, S. X., Pearson, N. D., & Poteshman, A. M. (2005). Stock price clustering on option expiration dates. *Journal of Financial Economics*, *78*(1), 49-87.

Niederhoffer, V., & Osborne, M. F. M. (1966). Market making and reversal on the stock exchange. *Journal of the American Statistical Association*, *61*(316), 897-916.

Ohta, W. (2006). An analysis of intraday patterns in price clustering on the Tokyo Stock Exchange. *Journal of Banking & Finance*, *30*(3), 1023-1039.

Palmrose, Z. V. (1988). 1987 Competitive Manuscript Co-Winner: An analysis of auditor litigation and audit service quality. *The Accounting Review*, 55-73.

Pope, D., & Simonsohn, U. (2011). Round numbers as goals: Evidence from baseball, SAT takers, and the lab. *Psychological Science*, *22*(1), 71-79.

Price III, R. A., Sharp, N. Y., & Wood, D. A. (2011). Detecting and predicting accounting irregularities: A comparison of commercial and academic risk measures. *Accounting Horizons*, *25*(4), 755-780.

Rangan, S. (1998). Earnings management and the performance of seasoned equity offerings. *Journal of Financial Economics*, *50*(1), 101-122.

Richardson, S. A., Sloan, R. G., Soliman, M. T., & Tuna, I. (2005). Accrual reliability, earnings persistence and stock prices. *Journal of Accounting and Economics*, *39*(3), 437-485.

Sonnemans, J. (2006). Price clustering and natural resistance points in the Dutch stock market: A natural experiment. *European Economic Review*, *50*(8), 1937-1950.

Sopranzetti, B. J., & Datar, V. (2002). Price clustering in foreign exchange spot markets. *Journal of Financial Markets*, *5*(4), 411-417.

Subramanyam, K. R. (1996). The pricing of discretionary accruals. *Journal of Accounting and Economics*, *22*(1-3), 249-281.

Teoh, S. H., Wong, T. J., & Rao, G. R. (1998). Are accruals during initial public offerings opportunistic?. *Review of Accounting Studies*, *3*(1-2), 175-208.

Weber, J., & Willenborg, M. (2003). Do expert informational intermediaries add value? Evidence from auditors in microcap initial public offerings. *Journal of Accounting Research*, *41*(4), 681-720.

Wyckoff, P. (1963). The psychology of stock market timing. Prentice-Hall, New Jersey, USA.